

EXHIBIT 13

1 UNITED STATES DISTRICT COURT

2 FOR THE

3 DISTRICT OF VERMONT

4 * * * * *

5 JAMES D. SULLIVAN, LESLIE ADDISON, *

6 SHARYN JONES, and BISHOP ROBIN HOOD *

7 GREENE, individually, and on behalf *

8 of a Class of persons similarly *

9 situated, *

10 Plaintiffs, * Case No.

11 vs. * 5:16-cv-00125

12 SAINT-GOBAIN PERFORMANCE PLASTICS *

13 CORPORATION, *

14 Defendant. *

15 * * * * *

16
17
18 VIDEOTAPED DEPOSITION OF

19 ALAN DUCATMAN, M.D.

20 February 28, 2018

VIDEOTAPED DEPOSITION

OF

ALAN DUCATMAN, M.D., taken on behalf of the Defendant
herein, pursuant to the Rules of Civil Procedure, taken
before me, the undersigned, Danielle S. Ohm, a Court
Reporter and Notary Public in and for the Commonwealth
of Pennsylvania, at the law offices of Bailey &
Glasser, LLP, 6 Canyon Road, Suite 200, Morgantown,
West Virginia, on Wednesday, February 28, 2018,
beginning at 8:32 a.m.

A P P E A R A N C E S

JAMES S. WHITLOCK, ESQUIRE

Davis & Whitlock

21 Battery Park Avenue

Suite 206

Ashville, NC 28801

COUNSEL FOR PLAINTIFFS

BERT L. WOLFF, ESQUIRE

RACHEL PASSARETTI-WU, ESQUIRE

Quinn, Emanuel, Urquhart & Sullivan, LLP

51 Madison Avenue

22nd Floor

New York, NY 10010

CO-COUNSEL FOR DEFENDANT

I N D E X

DISCUSSION AMONG PARTIES

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WITNESS: ALAN DUCATMAN, M.D.

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By Attorney Wolff

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P R O C E E D I N G S

VIDEOGRAPHER:

Good morning.

We are going on the record at 8:32 a.m. on February 28th, 2018. Please note that the microphones are sensitive and may pick up whispering, private conversations and cellular interference. Please turn off all cell phones or place them away from the microphones as they can interfere with the deposition audio. Audio and video recording will continue to take place all parties agree to go off the record.

This is Media Unit 1 of the video recorded deposition of Alan Ducatman, M.D., taken by counsel for the Defendant in the matter of James D. Sullivan, et al. v. Saint-Gobain Performance Plastics Corp., et al.

This deposition is being held at Bailey & Glasser, located at 6 Canyon Road, Suite 200, Morgantown, West Virginia, 26508.

My name is Jacob Stock from the firm Veritext, and I am the videographer. The court reporter is Danielle Ohm from the firm Veritext.

I am not related to any party in this action nor am I financially interested in the outcome. Counsel and all present in the room and everyone

1 attending remotely will now state their appearances and
2 affiliations for the record.

3 ATTORNEY WOLFF:

4 Bert Wolff for Defendant.

5 ATTORNEY PASSARETTI-WU:

6 Rachel Passaretti-Wu for Defendant.

7 ATTORNEY WHITLOCK:

8 Jamie Whitlock with Davis and Whitlock on
9 behalf of the Plaintiffs.

10 VIDEOGRAPHER:

11 Will the court reporter please swear in
12 the witness?

13 COURT REPORTER:

14 Doctor, will you please raise your right
15 hand?

16 ---

17 ALAN DUCATMAN, M.D.,

18 CALLED AS A WITNESS IN THE FOLLOWING PROCEEDING, AND
19 HAVING FIRST BEEN DULY SWORN, TESTIFIED AND SAID AS
20 FOLLOWS:

21 ---

22 EXAMINATION

23 ---

24 BY ATTORNEY WOLFF:

25 Q. Please state your name.

1 A. Alan Ducatman.

2 Q. Do you consider yourself to be an expert in
3 epidemiology?

4 A. No.

5 Q. Are you a toxicologist?

6 A. No.

7 Q. As a general principle, you would agree that
8 physicians and scientific investigators should try to
9 look at issues critically.

10 True?

11 A. Yes.

12 Q. And physicians and scientific investigators are
13 concerned about being accurate.

14 True?

15 A. Yes.

16 Q. As a physician and a scientific investigator, do
17 you subscribe to the principle that it is important to
18 use accuracy and precision in your writings?

19 A. Yes.

20 Q. Do you believe that scientists should describe
21 their methods and explain their reasoning so that
22 others can understand how the data were analyzed and
23 how the conclusions were reached?

24 A. Yes.

25 Q. You would agree that criticism and rigorous

1 attempts at refutation of a hypothesis being advanced
2 is an integral part of the scientific method.

3 Correct?

4 A. It is the scientific method.

5 Q. Would you agree that one of the hallmarks of
6 science is the requirement of valid and reliable data?

7 A. Yes.

8 Q. In your opinion, is it important to assess all of
9 the available data relevant to the question at hand
10 before arriving at a conclusion?

11 A. Yes.

12 Q. Do you agree that no study can be assessed in
13 isolation and that all evidence-based literature is
14 needed to form an opinion in evidence-based medicine?

15 ATTORNEY WHITLOCK:

16 Object to the form.

17 A. Could you repeat that question? It went on a bit.

18 BY ATTORNEY WOLFF:

19 Q. Do you agree that no study can be assessed in
20 isolation and that all evidence-based literature is
21 needed to form an opinion in evidence-based medicine?

22 ATTORNEY WHITLOCK:

23 Same objection. You can answer if you
24 understand.

25 A. I think what you said is usually true. It's

1 almost always true. And then I can think of
2 exceptions.

3 BY ATTORNEY WOLFF:

4 Q. Do you agree that all available papers are
5 considered in a scientific deliberation and that
6 selective consideration of the literature is not a
7 scientific procedure?

8 A. So certainly the latter part --- that's a two-part
9 question. So let's address the easy part first. You
10 don't want to be selective. You want to address what
11 you think is relevant. The first part said all. And
12 all is a tough nut to crack for any human because
13 there's just a lot.

14 Q. Do you agree that selective cherry picking of data
15 is inconsistent with a valid and reliable scientific
16 methodology.

17 ATTORNEY WHITLOCK:

18 Object to the form, vague and ambiguous.

19 A. Could you repeat the question?

20 BY ATTORNEY WOLFF:

21 Q. Do you agree that selective cherry picking of data
22 is inconsistent with a valid and reliable scientific
23 methodology?

24 A. No one wants to be just cherry picking when they
25 come up with a method.

1 Q. In your opinion, is it scientifically valid to use
2 one hypothesis to prove another hypothesis?

3 A. I don't know that I have an opinion about that
4 because I don't yet know what you mean by that.

5 Q. In scientific writings what does the word suggests
6 mean?

7 ATTORNEY WHITLOCK:

8 Object to the form.

9 A. I think it depends on the author.

10 BY ATTORNEY WOLFF:

11 Q. How do you use the term?

12 A. I try to use it to mean just what it says, that it
13 suggests something else is the case. I think if you
14 wanted a synonym you could use the word supports.

15 Q. In scientific parlance does the word suggests mean
16 that something is a hypothesis requiring further
17 scientific investigation and study?

18 A. I don't think so.

19 Q. You would agree there is a difference in expertise
20 between, A, diagnosing the presence of a medical
21 condition and, B, determining the cause of that
22 condition.

23 True?

24 A. A different --- so the expertise to know the cause
25 and the expertise to know that it exists are different?

1 They're sometimes different and sometimes the same.

2 Q. You would agree that in most cases and
3 particularly when considering environmental exposures
4 we do not --- strike that.

5 Wouldn't you agree that in most cases and
6 particularly when considering environmental exposures
7 we do not know what caused the given individual to
8 develop the disease identified in a differential
9 diagnosis.

10 Correct?

11 A. That question is so broad I don't know how to
12 answer it. Are we asking that question in the context
13 of a person who has a particular exposure known to
14 cause the disease or are we asking it in the context of
15 just the general population and you're saying a person
16 has this disease; therefore, did that cause it?

17 Q. I'm asking a person comes in and gets diagnosed
18 with a disease. Wouldn't you agree that in most cases
19 and particularly when considering environmental
20 exposures we don't know what caused that individual to
21 develop the disease?

22 A. You know, I followed you through most cases,
23 because that made sense, up to the point when you said
24 and considering environmental exposures, at which point
25 you become wrong in a lot of cases. So I agree with

1 sort of half of your hypothesis or whatever you want to
2 call that, your statement, and the rest I think I'm
3 unsure about because I'm not sure I know what you mean.

4 Q. Doctor, do you remember giving a deposition under
5 oath in the case of Wiley against Fairmont General
6 Hospital on June 17th, 1996?

7 A. No.

8 Q. Okay.

9 I'll give you a copy of the transcript of your
10 deposition from that case and direct your attention to
11 page 14, line three.

12 ATTORNEY WHITLOCK:

13 And I apologize. That was page 14, line
14 three?

15 ATTORNEY WOLFF:

16 Correct.

17 BY ATTORNEY WOLFF:

18 Q. And Doctor, do you remember me asking you this
19 question? Question, Doctor, wouldn't you agree that in
20 most cases we do not know what caused the given
21 individual to develop the disease identified in the
22 differential diagnosis. And your answer was what?

23 A. Well, your question was actually different. You
24 asked your question in two parts, so let's --- please,
25 excuse me, let's ask the court reporter to read back

1 the entire question with the business about the
2 environment in the question when you asked it because
3 let's just get the specifics so it's clear to anybody
4 who might be ---.

5 Q. Let me ---.

6 A. Excuse me. Let me finish.

7 Let's say that we have somebody --- I mean there's
8 --- there's examples everybody can relate to, so you
9 know, if you ask me this person has lung cancer, do we
10 know what caused the person's lung cancer, and we both
11 know where I'm going with this, the answer is no, we
12 don't know. Okay.

13 But if you ask me this person caused lung cancer
14 and this person was a three-pack-a-day smoker for 30
15 years, do we know what caused this person's lung
16 cancer, the answer is, to a reasonable degree of
17 medical certainty, this person's lung cancer was caused
18 by cigarette smoking.

19 So when you ask the question and it's about the
20 entire population independent of an environmental
21 question, the answer is yes. If you ask the question
22 and you get down to an environmental question where ---
23 which wasn't asked in 1996 and, you know, if I answered
24 it wrong in 1996 and answered it better today, that
25 would also be a detail.

1 But the point is you asked the question about an
2 environmental exposure tagged on at the end of the
3 question. And I specifically stated in my response to
4 you that, in general, we often don't know, but where
5 you get into the environmental issue we sometimes do
6 know.

7 Q. Do you remember being asked this question and
8 giving this answer? Question, Doctor, wouldn't you
9 agree that in most cases we do not know what caused a
10 given individual to develop a disease identified in a
11 differential diagnosis? And your answer was again, if
12 you are thinking about external etiologic agents
13 present in the environment, then I would agree with
14 you. And if that's the purpose of your question then I
15 can say, yes.

16 Do you recall giving that testimony, sir?

17 A. I do. And the point of that answer is that we
18 generally don't know what the external agent is. But
19 when we do know what the agent is, which is the way you
20 framed your question, okay, then sometimes that general
21 point about the population becomes --- becomes the
22 subpopulation and whom we do know the answer or we
23 suspect the answer.

24 So again, this question was asked differently. It
25 was asked about the general population and whom we are

1 not given any information about an etiologic agent, in
2 which case we don't know if an etiologic agent has
3 caused it. So my answer actually was correct then and
4 is correct today.

5 Q. Are you done?

6 A. Yes, sir.

7 Q. Good. Would you agree that the word association
8 is not a substitute for the word causation?

9 A. Yes.

10 Q. In fact, wouldn't you agree that distinguishing
11 between the concepts of causation and association is an
12 important area of scientific discussion?

13 A. Yes.

14 Q. Wouldn't you agree that a number of different
15 relationships may exist between an exposure and an
16 outcome and in one type may be a spurious association
17 resulting from chance, bias or confounding?

18 A. Yes,

19 Q. Do you agree that three general categories of
20 phenomena can result in an association found in a study
21 to be erroneous, chance, bias and confounding?

22 A. Could you repeat the question?

23 Q. Sure.

24 Do you agree that there are three general things
25 that can result in an association that is found in a

1 study to be erroneous, chance, bias and confounding?

2 A. I agree that all three of those can pertain.

3 Q. Does a statistically significant finding in a
4 reliable epidemiological study that looks at disease as
5 a function of exposure necessarily mean that there is a
6 causal relationship?

7 A. No.

8 Q. Would you agree that if bias or confounding
9 affects a study it can invalidate an association that
10 the study found even if it was statistically
11 significant?

12 A. It can.

13 Q. Can confounders be both known and unknown?

14 A. Yes.

15 Q. And can there be both known and unknown sources of
16 bias in an epidemiological study?

17 A. Yes.

18 Q. When you read the report of an epidemiologic study
19 in order to determine whether the results are
20 supportive of a cause and effect relationship between
21 the exposure and the disease, besides the relative risk
22 ratio, will you consider the study design, the study
23 numbers, the accuracy of the study, whether the study
24 results have been replicated elsewhere, biological
25 plausibility, internal consistency, dose response, the

1 confidence intervals, the statistical power, how well
2 the diagnoses were made and whether there is a
3 pathologic confirmation if the issue is cancer?

4 ATTORNEY WHITLOCK:

5 I'm going to object to the form to the ---
6 I don't even know the proper word for the type of
7 compound question that that was.

8 If you understood it, Dr. Ducatman, you're
9 welcome to answer.

10 A. There's one of them that you generally don't know
11 about because you have trouble discerning accuracy from
12 an external place. However, all of those things are
13 important. And the point I'm making is that those
14 things are important.

15 BY ATTORNEY WOLFF:

16 Q. You would agree that the statistical significance
17 test is a test of the data and not of the hypothesis
18 being advanced.

19 Correct?

20 A. Well, you're both --- you're right about that in a
21 narrow sense. And then in the wrong sense, when enough
22 statistical tests have been done on a hypothesis in
23 enough different settings people begin to believe that
24 the things are related.

25 So in a narrow technical sense, in a one-time

1 study I think that you're right. And then as
2 information piles up people begin to think that
3 statistical significance at some point begins to relate
4 to causation or at least to association and then
5 ultimately, in many cases, to causation. So mostly
6 right, but there's a caveat there depending on how much
7 work has been done.

8 Q. If the 95 percent confidence interval includes one
9 or, in fact, if the confidence interval for any
10 pre-determined level of statistical significance
11 includes one, then the data are not statistically
12 significant for that finding, are they?

13 A. Well, okay. That's a technical question in which
14 the answer can be wrong if the statistical significance
15 is set at a different level than 95 percent. But if
16 it's set at 95 percent, then what you said is a
17 tautology. It's a definition rather than additional
18 information. Say you defined it that way and,
19 therefore, it's true.

20 ATTORNEY WHITLOCK:

21 Counsel, did you mark this as an exhibit?

22 ATTORNEY WOLFF:

23 No.

24 ATTORNEY WHITLOCK:

25 I'd ask that you do. If you're going to

1 continue reading prior testimony of the deponent,
2 Counsel, I ask that you mark that as an exhibit to the
3 deposition, please, sir.

4 BY ATTORNEY WOLFF:

5 Q. Epidemiological studies never establish causation
6 in a particular person, do they?

7 A. Epidemiologic studies are not intended to
8 establish causation in a particular person. We do make
9 inferences that are based on epidemiology all the time.

10 Q. Doctor Ducatman, do you recall being asked this
11 question and giving this answer on page 17, line 11, at
12 your deposition in the Wiley matter? Question, do
13 epidemiological studies establish causation in a
14 particular person? Answer, never.

15 A. I think I just said that we do not use
16 epidemiologic studies to establish causation in a
17 particular person. We use epidemiologic studies to
18 make inferences about causation, which then get applied
19 to people.

20 Q. What is a cross-sectional study?

21 A. It's a study which doesn't have a temporal
22 element.

23 Q. And cross-sectional studies examine both the
24 exposure of interest and individuals with or without
25 the disease of interest at a single point in time.

1 Correct?

2 A. That's right.

3 Q. And while cross-sectional studies can determine
4 the prevalence of disease, they do not determine the
5 incidence or the risk of disease.

6 True?

7 A. You said two things. Could you --- could you make
8 that easier on yourself by boiling it down to one thing
9 so that we don't get into tearing the sentence apart?

10 Q. Yeah. Let's do it --- let's do it two questions.

11 While cross-sectional studies can determine the
12 prevalence of disease, they do not determine the
13 incidence of disease.

14 True?

15 A. Correct.

16 Q. While cross-sectional studies can determine the
17 prevalence of disease, they do not determine the risk
18 of disease.

19 True?

20 A. That's not necessarily correct.

21 Q. When is it not necessarily correct?

22 A. Cross-sectional studies can give you a risk ratio.

23 Q. What are the limitations of cross-sectional
24 studies?

25 A. There are many.

1 Q. What are they?

2 A. First of all, they don't give you incidence, just
3 as you've pointed out.

4 Secondly, they are subject to biases. The
5 incidence studies are not very good at dealing with
6 diseases which take people out of the population before
7 the study is done. So cross-sectional studies are bad
8 at looking at diseases that are rapidly fatal.

9 They also have problems with extremely common
10 diseases in some cases unless there are biomarkers, in
11 which case they actually become good.

12 Q. Are you finished with your answer?

13 A. I'm sure I can think of more if I sat --- I'm not
14 sure you want me to sit and think of more answers.
15 It's up to you.

16 Q. Let me ask you this. Are you comfortable with
17 your answer?

18 A. I am comfortable with it, although I'm sure it's
19 incomplete. I'm sure there's more things that we could
20 discuss.

21 Q. In cross-sectional studies, because both exposure
22 and disease are determined at the same point in time,
23 such studies do not demonstrate that the exposure
24 preceded the disease, do they?

25 A. That depends. They often do.

1 Q. Isn't it true that because cross-sectional studies
2 measure exposures and health conditions simultaneously
3 the temporal relationship between an exposure and a
4 disease cannot be inferred in a cross-sectional study?

5 A. Again, that depends. It depends on how the
6 cross-sectional study was done.

7 Q. What about the design of a cross-sectional study
8 would allow a temporal relationship to be satisfied?

9 A. If the --- if the study allowed you to know when
10 the diagnoses were made, even though you don't have an
11 incident population, and you also know when the
12 exposures occurred, even though you don't have an
13 incident population, you can make inferences about the
14 relationship between the exposures and the outcomes in
15 the study with limitations that have already been
16 mentioned and possibly some others.

17 Q. Is it fair to say that cross-sectional studies are
18 rarely useful in identifying toxic agents?

19 A. I have to think about that quite a bit because you
20 may know that I've written about --- fairly
21 extensively, I'm considered an expert on what --- how
22 new diseases are detected. And it turns out that while
23 on average we don't detect a new disease or a new cause
24 of a disease very often, when we do detect one it's
25 more often not an incident study. It's more often a

1 cross-sectional study or even simply a case report in
2 some cases which allows us to detect the initial
3 presence of a cause of a disease that we didn't know
4 about before.

5 So there's two ways to think about that. If you
6 look at --- this is kind of like your population
7 question before. If you look at when you don't know
8 anything and it's everything in the world is out there,
9 the answer to your question would be yes because it's
10 rare that we find new diseases.

11 But let's say that something new raises its head.
12 Let's --- let's take it away from this topic so it's
13 neutral. Let's say it's bronchiolitis obliterans in
14 people who make flavorings for popcorn.

15 Q. Yes, the diacetyl issue?

16 A. Correct.

17 Q. Okay.

18 A. So there you have it exactly. So it was not first
19 noticed because somebody did an incident study.

20 Q. Right. Alan Parnet came up with it?

21 A. Well, there's actually some disagreement about who
22 thought of it first. I'm not going to get into --- I
23 mean, generally, he's credited. I've heard of others.
24 That's not important. The point is that it depends on
25 context as to how useful the cross-sectional study is

1 for identifying new diseases. And it turns out that
2 where new diseases arise, that just happens to be one
3 of the ways we find them and it's not at all that
4 uncommon.

5 Q. Let's switch gears for a moment.

6 Okay?

7 When we say that something is biologically
8 plausible that simply means that it makes biological
9 sense.

10 True?

11 A. Yes.

12 Q. You would agree that biologic plausibility is not
13 synonymous with causation, wouldn't you?

14 A. Yes.

15 Q. Does the dose response relationship stand for the
16 proposition that the greater the dose, the greater the
17 likelihood for the effect?

18 A. That's generally how it's interpreted.

19 Q. Is it fair to say that it is not ---?

20 A. Excuse me. Let me interrupt myself. I apologize.

21 That is generally how it's interpreted when it's
22 monotonic. And there are times when it's not. They
23 are rarer and then people get into arguments.

24 Q. Monotonic meaning what for the benefit of the
25 Judge?

1 A. That it's either linear or log-linear or ---
2 increasing the dose leads to increasing outcomes.
3 There are these puzzling things that people see where
4 there are inverted U shapes and things like that and
5 you hear the head of NIEHS discuss these in public
6 places. But generally when people talk about dose
7 response they're not talking about these puzzling
8 things. They're generally talking about the historical
9 linear dose response curves. So that's how I initially
10 answered the question.

11 Q. So they're not talking about hormesis and things
12 like that?

13 A. Well, hormesis is yet another question.

14 Q. All right.

15 Let's defer that issue.

16 A. Yeah, let's not get --- let's please not get into
17 --- hormesis has nothing to do with anything that
18 you're concerned about today that I can think of, so
19 let's not get into that.

20 Q. Isn't it fair to say that it is not only important
21 to know that a substance is capable qualitatively of
22 causing something, but that is also important to know
23 the quantitative eligibility of the suspected agent?

24 A. Could you say that a different way?

25 Q. Sure.

1 Is dose important?

2 A. Yes.

3 Q. Isn't there a classic saying that everything is
4 toxic and that it's just a matter of dose?

5 A. Yes.

6 Q. So then a sufficient dose of table salt can be
7 quite toxic.

8 True?

9 A. Yes.

10 Q. Oxygen can be toxic?

11 A. Very.

12 Q. What is a threshold?

13 A. Threshold is generally the lower limit of
14 detection in --- it depends on if you're talking about
15 humans or all species.

16 Some --- and it's not stipulated in advance. It's
17 just the lowest threshold you can find for some outcome
18 that is physiologically there and generally considered
19 to be detrimental.

20 Q. Is it fair to say that the concept of a threshold
21 suggests that below a certain exposure something is not
22 toxic?

23 A. That's a very simple sounding question with a very
24 complicated answer. Do you want me to start into that?

25 Q. If you could answer it yes or no, that would help?

1 A. I will answer it no because you've implied that if
2 we have a threshold that we know is not toxic below
3 that threshold, and that's incorrect.

4 Q. You would agree that cigarette smoking can cause
5 lung cancer.

6 Correct?

7 A. Yes.

8 Q. You would not consider smoking one cigarette in a
9 lifetime to pose a significant risk of lung cancer,
10 would you?

11 A. I don't recommend smoking any cigarettes. I'm not
12 sure what you mean by significant. However, most
13 people who smoke one cigarette in their life don't get
14 lung cancer and also don't tell us about smoking that
15 one cigarette.

16 Q. If someone did develop lung cancer after smoking
17 one cigarette, would you conclude there was a
18 significant probability that it was caused by the one
19 cigarette?

20 A. No.

21 Q. Do we agree that a temporal relationship does not
22 establish causation? In other words, just because a
23 condition follows an exposure it does not necessarily
24 mean that the exposure caused the condition.

25 Correct?

1 A. That's correct. And in addition, to save time,
2 the opposite is very important, to say the exposure has
3 to precede the condition.

4 Q. And when one considers the effects of exposure to
5 a chemical, isn't it important to distinguish between
6 effects that have been reported and those which are
7 merely feasible or theoretically possible?

8 ATTORNEY WHITLOCK:

9 Object to the form.

10 A. I'm confused by the question. Let me tell you why
11 I'm confused. When we --- when we --- when we do
12 research we generally don't enter into some list of
13 things that are theoretically possible that are
14 unrelated to the topic. We just generally don't even
15 go there. So I'm not sure yet what the question means.
16 If you can give me a specific as to how you mean that
17 it might help me to answer the question better.

18 BY ATTORNEY WOLFF:

19 Q. I'm just going to move on. Thanks, Doctor.

20 Is it fair to you say that extrapolating data from
21 animal models to humans can be fraught with
22 difficulties?

23 A. That's fair.

24 Q. Is it fair to say that attempts to extrapolate
25 data from animal models to humans must be done with

1 caution?

2 A. It must be done with scientific capability. It's
3 --- all of science is done with caution. There's no
4 more caution needed for that extrapolation. And ---
5 and I'm not totally sure that the word that you should
6 use or that I should use, since it's me answering the
7 question, is extrapolation.

8 Let's just say that animal models give us lots of
9 very important information. And so that it's clear,
10 defense experts also use that information all the time,
11 okay. And the information should be used as correctly
12 as we can and in the right context.

13 Q. Okay.

14 Would you please turn with me to page 35, line one
15 of your deposition in the Wiley case. And my question
16 to you is do you recall being asked this question and
17 giving this answer. Question, isn't it fair to say
18 that attempts to extrapolate data from animals to
19 humans must be done with caution. And your answer was
20 yes.

21 Correct?

22 A. I'm sorry. I still haven't found this.

23 Q. Page 35, line one to line four.

24 A. That's correct.

25 Q. Isn't it fair to say that, among other things,

1 there can be interspecies differences in metabolic
2 rates, anatomy, cellular or biochemistry and in the
3 absorption, distribution, metabolism and elimination of
4 chemicals?

5 A. Yes.

6 Q. Wouldn't you agree that the results of an animal
7 study will be influenced in part by which species of
8 animals are used?

9 A. Yes. And it's --- to, be clear it's even finer
10 than species. Within species there are specific
11 animals bred for specific purposes. And the selection
12 of those are very important to studies.

13 Q. So even different strains of the same species
14 sometimes experience different reactions to the same
15 substances.

16 True?

17 A. Yes, that's --- that can be true.

18 Q. And what is the ATSDR?

19 A. The ATSDR is the Agency for Toxic Substances and
20 Disease Registry. It's an important part of the U.S.
21 Centers for Disease Control and Prevention.

22 ---

23 (Whereupon, Exhibit 1, August 2015 ATSDR
24 CDC Tox Guide for Perfluoroalkyls, was
25 marked for identification.)

1

2

BY ATTORNEY WOLFF:

3

Q. Dr. Ducatman, Exhibit 1 is a copy of the August 2015 ATSDR CDC Tox Guide for Perfluoroalkyls.

5

Have you seen this document before?

6

A. Yes.

7

Q. Please turn with me to the second page and the right-hand column and the second bullet point.

9

Are you there?

10

A. I think I'm on the second page because the other one is labelled with a red one, but I'm not sure which is one and which is two.

12

13

Q. You're on the second page.

14

The second bullet points says, and I quote, the primary effects observed in animals include liver toxicity, developmental toxicity and immune toxicity. There are profound differences in the toxicokinetics and mode of action of perfluoroalkyls between humans and experimental animals. Many of the observed effects in animals result from the ability of PFOA and PFOS to activate peroxisome proliferatory-activated receptor alpha, PPAR-alpha.

15

16

17

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22

23

Humans are much less responsive to PPAR-alpha than rodents and thus may not be as susceptible to these types of effects, closed quote.

24

25

1 Have I read that correctly?

2 A. I'm sorry. I'm not reading it along with you.
3 I'm just listening to you read it. And I assume you
4 read it correctly.

5 Q. Do agree with that statement?

6 A. I agree with much of the statement. And there's a
7 piece of it that I'm sure --- I can't speak for ATSDR.
8 I used to advise them, but I can't speak for them.

9 There's a piece of it that if an ATSDR scientist
10 and I were sitting down together, we could discuss why
11 they wrote it that way and when they're going to change
12 it.

13 Q. What would that be?

14 A. Okay.

15 So let's go --- can you point to where this is?

16 Q. Yes.

17 A. Primary effects? Okay. Thank you.

18 So it is true that many of the effects in animals
19 are due to PPAR-alpha. Okay. It's also true that
20 effects in humans are due to PPAR-alpha. And it's also
21 true that animal PPAR-alpha in many cases is much more
22 present and much stronger than it is in humans. So
23 that's the piece of it that is true.

24 Now the issue is that actually well before 2015,
25 but certainly in the past couple of years, it's become

1 clear that both in animals and in humans many of the
2 effects are not PPAR-alpha. And despite the weaker
3 PPAR-alpha in humans, there are things that we see in
4 humans that it took us a while to figure out how to see
5 in animals.

6 Q. Is it fair to say that all human beings are
7 exposed to thousands of chemicals and they have many
8 infectious diseases and they are a complex product of
9 their environment and their genetics?

10 ATTORNEY WHITLOCK:

11 Object to the form. Compound question.

12 A. So the syntax of that question in which I heard,
13 but you probably don't mean, that the chemicals have
14 infectious diseases is puzzling to me. Could you
15 clarify what you mean?

16 BY ATTORNEY WOLFF:

17 Q. Sure.

18 Is it fair to say that all human beings are
19 exposed to thousands of chemicals, that human beings
20 have many infections diseases and that human beings are
21 complex product of their environment and their
22 genetics?

23 A. There's nothing terribly wrong with that
24 statement. If I were describing human beings, that's
25 not how I'd do it, but that's --- there's nothing wrong

1 with that statement.

2 Q. When considering the effects of exposure to a
3 chemical, shouldn't one consider what is known, what is
4 not known and what the external risk factors are for
5 the individual?

6 A. You know, I heard the question, but I don't
7 understand it.

8 Q. Have you spoken to any of the individual
9 Plaintiffs?

10 A. No.

11 Q. Have you examined any of the individual
12 Plaintiffs?

13 A. No.

14 Q. Have you reviewed any medical records for any of
15 the individual Plaintiffs?

16 A. No, save one possible exception. I've seen a
17 couple of serum concentrations.

18 Q. And that's the full extent of ---?

19 A. That's correct.

20 Q. Okay.

21 Different people drink different amounts of water
22 on average over the course of --- course of a day.

23 True?

24 A. Yes.

25 Q. Some people will typically drink only tap water,

1 some people will typically drink only bottled water and
2 some people will typically drink a combination of both.

3 True?

4 A. Yes.

5 Q. And the sources of tap water, even in the areas at
6 issue in this matter, can be different from house to
7 house.

8 Correct?

9 ATTORNEY WHITLOCK:

10 Objection. Calls for speculation.

11 A. I think you're asking me do these individuals,
12 some of them reside with private wells that are
13 different from each other. And if that's the question,
14 the answer is yes.

15 BY ATTORNEY WOLFF:

16 Q. And some of them also have water delivered from
17 the municipal supply as opposed to private wells.

18 True?

19 A. I'm not aware of individual behaviors in that
20 regard, but it's a --- it would be speculation on my
21 part and I think it's probably --- especially now,
22 after contamination has been discovered, a very
23 reasonable speculation.

24 Q. Different people will also use different sources
25 of water for cooking.

1 Correct?

2 A. Yes.

3 Q. Some people will cook exclusively or primarily
4 with tap water, whereas other people will cook
5 exclusively or primarily with bottled water.

6 Correct?

7 A. I think that's true. I think there is probably
8 fewer differences between people --- I know people who
9 do cook with --- with delivered bottled water, but most
10 people cook with tap water.

11 Q. At the time you issued either your first report or
12 your second report in this matter did you have any
13 Plaintiff-specific information as to the average daily
14 consumption of water by the individual Plaintiffs?

15 A. No.

16 Q. As of the time you issued either your first or
17 your second report in this matter did you have any
18 Plaintiff-specific information as to the percentages of
19 tap water versus bottled water typically consumed by
20 the individual Plaintiffs?

21 A. No.

22 Q. Do you know whether the water consumption
23 practices and patterns of the proposed class
24 representatives are typical of the water consumption
25 practices and patterns of the absent class members?

1 A. I don't know for either class --- or group. I
2 should say group.

3 ---

4 (Whereupon, Exhibit 2, Expert Report Dated
5 9/1/17, was marked for identification.)

6 ---

7 BY ATTORNEY WOLFF:

8 Q. Dr. Ducatman, Exhibit 2 is a copy of your expert
9 report for class certification in this matter dated
10 September 1, 2017.

11 Correct?

12 A. I won't --- I'll accept the date. I don't
13 remember what the date is. I assume you're correct.

14 ATTORNEY WHITLOCK:

15 For the record, what was Exhibit 1,
16 Counsel?

17 ATTORNEY WOLFF:

18 The ATSDR Tox Guide.

19 ATTORNEY WHITLOCK:

20 And you're not marking the deposition from
21 over 20 years ago that you repeated many of the
22 questions verbatim from.

23 Correct?

24 ATTORNEY WOLFF:

25 Correct.

1 ATTORNEY WHITLOCK:

2 Okay.

3 ---

4 (Whereupon, Exhibit 3, Declaration, was
5 marked for identification.)

6 ---

7 BY ATTORNEY WOLFF:

8 Q. Exhibit 3 is a copy of your Declaration in which
9 you declare that your class certification report
10 contains a complete statement of all opinions you will
11 express relevant to the issue of class certification
12 and the basis and reasons for them as well as the
13 materials you considered in forming these opinions.

14 Correct?

15 A. Yes.

16 ---

17 (Whereupon, Exhibit 4, Expert Merits
18 Report, 12/15/17, was marked for
19 identification.)

20 ---

21 BY ATTORNEY WOLFF:

22 Q. Exhibit 4 is a copy of your expert merits report
23 in this matter dated December 15, 2017.

24 Correct?

25 A. I'll accept the date and it is my report.

1 Q. And in the opening words of your expert merits
2 report, in the first sentence you state that the
3 contents of your class certification report are
4 incorporated by reference into your merits report.

5 Correct?

6 A. Yes.

7 ---

8 (Whereupon, Exhibit 5, Declaration, was
9 marked for identification.)

10 ---

11 BY ATTORNEY WOLFF:

12 Q. Exhibit 5 is a copy of another Declaration in
13 which you declare that your expert merits report
14 contains a complete statement of all opinions you will
15 express relevant to the merits of this matter and the
16 basis and reasons for them as well as the materials you
17 considered in forming these opinions.

18 Correct?

19 A. Yes.

20 Q. Just as a housekeeping matter, in order to prevent
21 the questioning today from getting unwieldy, please
22 understand when I use the phrase your report I am going
23 to be referring generally to your class certification
24 report, which is Exhibit 3.

25 If I want to direct your attention specifically to

1 your merits report, which is Exhibit 5, I will try to
2 use the phrase merits report.

3 ATTORNEY WHITLOCK:

4 Counsel, both of those exhibits you just
5 stated are wrong. The merits ---.

6 ATTORNEY WOLFF:

7 I'm sorry. You're absolutely right.

8 Strike that.

9 BY ATTORNEY WOLFF:

10 Q. In order to prevent the questioning from getting
11 unwieldy, Dr. Ducatman, please understand that when I
12 use the phrase your report I am referring generally to
13 your class certification report, which has been marked
14 as Exhibit 2. And if I want to direct your attention
15 specifically to your merits report, which has been
16 marked as Exhibit 4, I'll try to use the phrase merits
17 report.

18 Okay? Okay?

19 A. Exhibit 2 is what you'll usually be referring to?

20 Q. Correct.

21 Now, page 13 of your report, Exhibit 2, six lines
22 up from the top, you state that the Bennington
23 population is homogenous only in their exposure to PFOA
24 through their drinking water. That's what you wrote.

25 Correct?

1 A. Yes.

2 Q. What do you mean by homogenous?

3 A. That the thing that makes them into a population
4 in a public health sense or medical sense is that the
5 common risk they share for those who --- let's leap
6 ahead and say that the class is certified and it's
7 certified consisting of people who have PFOA documented
8 to be in their bodies. Those people will be homogenous
9 in the sense that they have been exposed to PFOA in
10 drinking water.

11 Q. At any level?

12 A. No. There's a --- I don't recall that we said any
13 level. I recall that there was actually ---.

14 Q. You said above background?

15 A. Yes.

16 Q. Above back.

17 So when you say homogenous you mean that they have
18 been exposed to PFOA and have PFOA in their blood serum
19 above background levels?

20 A. Correct.

21 Q. At the time you issued your report had you
22 reviewed the Second Amended Complaint in this matter?

23 A. Second --- so I should be able to answer that
24 question, but you're talking --- you're using legal
25 terms and I may need to figure out what you mean and

1 the dates on things.

2 Q. Have you reviewed any of the complaints in this
3 matter?

4 A. I have reviewed the Second Amended Complaint. But
5 do I recall when I saw it? I do not. This is a date
6 thing and I just don't remember in what sequence I saw
7 what.

8 Q. Were you aware that the named Plaintiffs in this
9 matter have submitted sworn Answers to Interrogatories?

10 A. I don't think so. If I'm wrong, the Plaintiff
11 attorney can correct me, but I don't think I've seen or
12 known about their sworn answers.

13 Q. Since it's not listed in your report, at the time
14 you issued your report, had you reviewed any of the
15 Interrogatory Answers from any of the named Plaintiffs?

16 A. I don't think so. I could stand corrected, but I
17 don't think I did.

18 Is that what --- is that what --- no, the Second
19 Amended Complaint can't be their Interrogatories, so
20 that's something else.

21 Q. Have you reviewed any of the Interrogatory Answers
22 from any of the named Plaintiffs since you issued
23 either your class certification report or your merits
24 report in this matter?

25 A. I think I already answered that. I don't think I

1 have. But if Plaintiff attorney says I have I could
2 stand corrected, but I don't remember seeing any of
3 their discussions about their histories.

4 ---

5 (Whereupon, Exhibit 6, 7/13/17
6 Interrogatory Responses from Linda
7 Crawford and Theodore Crawford, was marked
8 for identification.)

9 ---

10 BY ATTORNEY WOLFF:

11 Q. Marked as Exhibit 6 I'm handing you a copy of the
12 July 13, 2017 Interrogatory Responses from Linda
13 Crawford and Theodore Crawford. To the best of your
14 recollection, Dr. Ducatman, you have not seen these
15 before.

16 Correct?

17 A. That's correct, I have not --- I do not recall
18 ever seeing these before.

19 Q. Please turn with me to Response One on page three.
20 The Interrogatory Response states that Mr. and Mrs.
21 Crawford purchased their home at 643 West Road,
22 Bennington, Vermont, in 1985 and have lived there since
23 then.

24 Correct?

25 A. That's what it says.

1 Q. So they've been living at their home in Bennington
2 for more than 30 years.

3 True?

4 A. This is what date? Yes, it's got to be the last
5 couple of years, so that is true.

6 Q. Please turn with me to Interrogatory Responses
7 Six, Seven and Eight on pages four and five. In each
8 instance after the objections the responses state,
9 quote, our home has a private well that tested
10 nondetect for PFOA on September 21, 2016. A more
11 recent test on April 13, 2017 showed PFOA at 4.1 parts
12 per trillion. Our blood tests from 2016 appear to
13 indicate that we have not been exposed to PFOA in our
14 water.

15 Do you see that?

16 A. Yes.

17 Q. How do these sworn Interrogatory responses from
18 Mr. and Mrs. Crawford square with your assertion that
19 that the Bennington population is homogenous only in
20 their exposure to PFOA through their drinking water?

21 ATTORNEY WHITLOCK:

22 Objection to form, misleading.

23 A. I actually don't understand your question because
24 it's not clear to me what their blood tests showed and
25 we already discussed who would be and who wouldn't be

1 in the population. So I don't know --- I have no way
2 of knowing if your question is misleading by accident
3 or deliberately or if it has a correct implication in
4 it. I just can't tell because the data are not there.
5 BY ATTORNEY WOLFF:

6 Q. Okay.

7 Well, if you take a look at each --- the last
8 sentence in each response it says our blood tests from
9 2016 appear to indicate that we have not been exposed
10 to PFOA in our water.

11 Do you see that?

12 A. Right.

13 Q. And then ---.

14 A. That's what they said. Now, let's assume ---
15 let's go down the list.

16 I'm sorry. Go ahead and ask your question.

17 Q. On page seven there is a sworn statement that they
18 have read these Interrogatory Answers and swear under
19 the pains of penalties of perjury that the answers are
20 true and correct to the best of their knowledge,
21 information and belief.

22 Do you see that?

23 A. Yes.

24 Q. How do these sworn Interrogatory responses from
25 Mr. and Mrs. Crawford square with your assertion that

1 the Bennington population is homogenous only in their
2 exposure to PFOA through their drinking water?

3 ATTORNEY WHITLOCK:

4 Same objection to the form, misleading.

5 A. I find your question to continue to be puzzling
6 and --- and I'm trying to find a gentle word --- not
7 just puzzling, I don't want to use the word misleading
8 because it's already been used. I don't know that
9 these people, these two individuals who are actually
10 --- one is a healthcare professional I can see from
11 this document. I don't know that they would be in the
12 population. And you have put that question as if not
13 only do I know, but they definitely are in the
14 population, whereas all of the answers make it appear
15 that they are not. But I can't be sure, so I mean ---
16 how to put this.

17 It's very difficult to answer question when they're
18 that --- is there a good synonym for misleading?

19 BY ATTORNEY WOLFF:

20 Q. I don't know that it was misleading. I thought I
21 was right up to you until you said it was misleading.
22 I thought it was a perfectly fine answer up until that
23 point.

24 Were you aware of the fact that in their Second
25 Amended Complaint in this matter the Plaintiffs

1 affirmatively allege that the property in North
2 Bennington owned by Plaintiff Gordon Garrison receives
3 its drinking and domestic water not from a private well
4 but from the Town of Bennington?

5 A. I'm sorry. Are these people the Garrisons?

6 Q. No.

7 A. You're losing me. Of course I'm not aware of what
8 you asked, but I'm not sure why you're asking me the
9 next question. I don't --- I don't understand the
10 question yet, but I'm certainly not aware of anybody
11 saying that.

12 Q. Okay.

13 A. And I don't know why you're asking.

14 Q. Okay.

15 ---

16 (Whereupon, Exhibit 7, 7/24/17
17 Interrogatory Responses from Gordon
18 Garrison, was marked for identification.)

19 ---

20 BY ATTORNEY WOLFF:

21 Q. Marked as Exhibit 7 I'm handing you a copy of July
22 24, 2017 Interrogatory Responses from Gordon Garrison.
23 And based on what you've told me, to the best of your
24 recollection, you have not seen these before.

25 True?

1 A. True.

2 Q. Please turn with me to Interrogatory Response
3 Number One on page three. That response states that
4 Mr. Garrison purchased his home at 19 Hillside Street
5 in North Bennington, Vermont in 1994 and has resided
6 there since that time.

7 Correct?

8 A. Yes.

9 Q. So he's been living at his home in North
10 Bennington for more than 20 years.

11 True?

12 A. True.

13 Q. Please turn with me to Responses Six, Seven and
14 Eight on pages four and five. And in each instance,
15 after the objections, the responses state, quote, my
16 home has town water and so I believe I have not been
17 exposed to PFOA in my water, closed quote.

18 Do you see that?

19 A. Yes.

20 Q. How do these sworn Interrogatory responses from
21 Mr. Garrison square with your assertion that the
22 Bennington population is homogenous only in their
23 exposure to PFOA through their drinking water?

24 A. I don't even begin to see any contradiction. And
25 I assume that you don't either. But in any event, this

1 individual, if he's correct and he has been drinking
2 delivered water that's not contaminated, let's say
3 delivered from a municipal facility, is not
4 contaminated with PFOA, he would not be in the
5 population that we've discussed.

6 Q. Were you aware that in their Second Amended
7 Complaint the Plaintiffs allege that the property in
8 North Bennington owned by James Sullivan and Leslie
9 Addison has a private drinking well that analytic
10 sampling showed to have 293 parts per trillion of PFOA?

11 A. Do I have that in front of me?

12 Q. No.

13 A. No.

14 Q. Were you aware that in the Second Amended
15 Complaint the Plaintiffs allege that the property in
16 North Bennington owned by William Sumner has a private
17 drinking well that analytic sampling showed to have 580
18 parts per trillion of PFOA?

19 A. No.

20 Let me provide one question. I have seen well
21 reports. I do not remember if those well reports are
22 linked to individual names. And if they are, I
23 certainly don't remember whose names they are.

24 Q. Fair.

25 Do you have copies of those well reports with you?

1 A. No.

2 Q. Back in your office?

3 A. No.

4 Q. When did you see them?

5 A. There are well reports that are --- I first saw
6 some well reports on or about March of 2017. And I was
7 in my office at the time and they were given to me.
8 Since that time my office has undergone a move and I
9 was told I could get back into the old office and
10 everything in it was gone by the time I got back in, so
11 I don't have those well reports.

12 ATTORNEY WOLFF:

13 Off the record for half a second. We can
14 stay on the video.

15 ---

16 (WHEREUPON, AN OFF RECORD DISCUSSION WAS HELD.)

17 ---

18 ATTORNEY WOLFF:

19 Back on.

20 BY ATTORNEY WOLFF:

21 Q. Dr. Ducatman, were you aware that in their Second
22 Amended Complaint the Plaintiffs allege that the
23 property in North Bennington owned by Ronald Haustor
24 has a private drinking well that analytical sampling
25 showed to have 2,730 parts per trillion of PFOA?

1 A. I'm aware of high levels, but I don't relate them
2 to individual names. I don't have a memory capable of
3 doing that.

4 Q. In the first full paragraph on page four of your
5 class certification report you state that consistent
6 with the published literature of the Vermont Department
7 of Health has found that PFOA levels in the blood of
8 Bennington residents are strongly correlated with PFOA
9 levels in well water.

10 Correct?

11 A. Yes.

12 Q. And towards the bottom of page three of your
13 report you state that, as of January 27, 2017 the
14 average blood serum level of PFOA among Bennington
15 residents tested by DOH was 10 micrograms per liter.

16 Correct?

17 A. That's in my reports.

18 Q. And in contrast, at the top of page four of your
19 report you state that the blood serum levels of PFOA
20 measured in the Plaintiffs Sullivan, Addison, Sumner
21 and Haustor are --- are 24.8, 40.9, 305.1 and 204.1
22 micrograms per liter respectively.

23 Correct?

24 A. Yes.

25 Q. And at the low end, among the individual

1 Plaintiffs whom you list, the 24.8 micrograms per liter
2 from Mr. Sullivan is nearly two and half times greater
3 the 10 micrograms per liter average among the
4 Bennington residents who were tested.

5 Correct?

6 A. Yes.

7 Q. And at the high end, among the individual
8 Plaintiffs whom you list, the 204.1 micrograms per
9 liter for Mr. Haustor is 20 times greater than 10
10 micrograms per liter average among the Bennington
11 residents who were tested.

12 Correct?

13 A. Yes.

14 Q. And even though they are named Plaintiffs, in your
15 report you do not address the PFOA levels in Mr.
16 Crawford, Mrs. Crawford and Mr. Garrison, do you?

17 ATTORNEY WHITLOCK:

18 Object to the form.

19 A. They don't appear there.

20 BY ATTORNEY WOLFF:

21 Q. Why did you choose not to address in your report
22 the PFOA levels in Mr. Crawford, Mrs. Crawford or Mr.
23 Garrison?

24 A. I don't recall why I didn't.

25 Q. Among the individuals residing within the areas at

1 issue in this matter would you expect there to be
2 considerable individual differences as to their amount
3 and length of exposures to PFOA?

4 A. Yes.

5 Q. Would you expect there to be considerable
6 individual differences as to what their PFOA blood
7 serum levels would be?

8 A. Yes.

9 Q. Would you expect there to be considerable
10 individual differences as to what their
11 susceptibilities, if any, to PFOA might be?

12 A. Yes.

13 Q. As to those individual differences and exposure of
14 blood levels and susceptibilities, if any, would that
15 be a function of a number of different variables?

16 A. Yes.

17 Q. And those individual differences would be a
18 function of, among other things, their ages.

19 Correct?

20 A. Age would be a variable.

21 Q. And those individual differences would be a
22 function of, among other things, their gender.

23 True?

24 A. Yes.

25 Q. Those individual differences would be a function

1 of, among other things, their physiology.

2 Correct?

3 A. Yes.

4 Q. Those individual differences would be a function
5 of, among other things, how long they lived in the
6 area.

7 True?

8 A. Yes.

9 Q. Those individual differences would be a function
10 of, among other things, their rates of daily water
11 consumption.

12 Correct?

13 A. Yes. And not just that, for the time that they
14 lived near the factory also, you know, their tidal
15 volume for breathing, because that's another route of
16 exposure.

17 Q. Those would all be different?

18 A. Yes.

19 Q. And the individual differences would also be a
20 function of, among other things, the concentrations of
21 PFOA in the water they drank.

22 Correct?

23 A. Yes.

24 Q. And those individual differences would also be a
25 function of, among other things, their sources of

1 water.

2 Correct?

3 A. You're pointing out their different --- their
4 different wells when they had wells or if they weren't
5 on a well and got delivered city water, is that what
6 you mean?

7 Q. Yes.

8 A. Yes, that's correct.

9 Q. And the individual differences would be a function
10 of, among other things, their diet and nutrition.

11 Correct?

12 A. There are differences between all of us from PFOA
13 and PFOS contaminants based on diet and nutrition. And
14 for most of us who don't have contaminated water, those
15 are the key ones, okay. So if you and I are lucky
16 enough to live in an area that's not contaminated,
17 those would be the biggest differences between us
18 because our water wouldn't be the important source.

19 Q. The individual differences would be a function of,
20 among other things, drug and alcohol use.

21 Correct?

22 A. Are you now talking about PFOA concentrations or
23 are you talking about their health?

24 Q. So I'm talking about their differences in
25 exposure, blood levels and susceptibilities, if any, to

1 exposure to PFOA.

2 A. Okay.

3 So if it's susceptibility, then the answer becomes
4 yes. Those --- those --- you can actually see tiny
5 differences in PFOA based on some of those, but they're
6 actually not that important. But --- but when you talk
7 about susceptibility for sure, that becomes an issue.

8 Q. And those individual differences would be a
9 function of, among other things, their body weight and
10 Body Mass Index or BMI.

11 Correct?

12 A. Yes.

13 Q. And those individual differences would be a
14 function of, among other things, their general state of
15 health as well as other medical conditions.

16 Correct?

17 A. Yes.

18 Q. And those individual difference would be a
19 function of, among other things, their occupational
20 histories.

21 Correct?

22 A. If their occupation had exposure to perfluoroalkyl
23 substances, that would be another and very important
24 route of exposure.

25 Q. In your opinion, what else, if anything, would

1 those individual differences in either exposures, blood
2 levels or susceptibility to PFOA, if any, be a
3 functions of?

4 A. Okay.

5 I don't remember all the things you mentioned, but
6 let me go down a list of things that we often adjust
7 for. So --- and you may think you included these under
8 general health, but renal function would certainly be
9 one. It turns out to actually not be as important as
10 you would expect. Big differences in renal function
11 for humans make only pretty small differences in
12 perfluoroalkyl substance in your serum, but they make
13 some.

14 Then another one that you may have mentioned and I
15 simply don't remember is drugs. There are some drugs
16 that can make a pretty substantial difference. They're
17 actually fairly rare, but there are some that can make
18 a big difference, especially for PFOS more than PFOA.

19 You mentioned gender. You mentioned age. Within
20 gender the specific --- and technically, because I'm a
21 doctor, I should be saying sex and not gender. Within
22 sex, the thing that --- the things that matter are very
23 specifically menstruation and lactation and pregnancy.
24 Menstruation is a way that PFOA leaves the body. Very
25 unfortunately, so are lactation and pregnancy. So

1 menstruation is a good way for it to leave the body.
2 Unfortunately, lactation and pregnancy are terrible
3 ways for it to leave the body because we're now passing
4 the contaminant to a fellow human being or to a child.

5 Let me see what else. There are so many things.
6 I'm a little worried about not being complete. Do you
7 want me to stop or do you want me to think of others?

8 Q. If you think that --- you know, you say that's all
9 I can recall as I'm sitting here right now, I'm happy
10 to take your ---.

11 A. Let's say that's all I recall as I'm sitting here
12 right now.

13 Q. The drugs that you refer to that can make a
14 substantial difference, probably PFOS and maybe PFOA,
15 what drugs are you referring to?

16 A. Well, really an older one was cholestyramine,
17 which used to be a pretty common drug. If you're as
18 old as I am, you actually used to give it. It's not
19 that effective for the condition we used to give it
20 for. Now we give it for much rarer conditions. And
21 it's sort of like kryptonite for PFOS. It just really
22 does a good job getting rid of it. And I have actually
23 published how well it works in the community. I got
24 data on that that just happens to be there because we
25 looked at a large population, as you know.

1 Q. That's in the C8 population?

2 A. Yes.

3 Q. Switching gears ---.

4 ATTORNEY WOLFF:

5 Let me just ask --- we've been going for a
6 little bit more than an hour. I'm perfectly prepared
7 to go a bit more unless anybody needs a break.

8 A. I'm good for now.

9 BY ATTORNEY WOLFF:

10 Q. Among other ailments, people have been
11 experiencing kidney cancer, testicular cancer, prostate
12 cancer, hepatitis, ulcerative colitis, osteoarthritis,
13 gout, pregnancy-induced hypertension and asthma for
14 hundreds of years and long before PFOA was ever
15 synthesized.

16 Correct?

17 A. Yes. We didn't necessarily make those diagnoses,
18 but, nonetheless, we can be pretty sure you're right.

19 Q. You are not offering the opinion that the levels
20 of PFOA in the drinking water in the Bennington area is
21 a cause of any particular disease in humans, are you?

22 A. I would prefer to answer that question in a very
23 different way. It's --- I'm offering the opinion that
24 it increases the risk of those diseases and I do not
25 intend to get involved in people who are in the --- any

1 disputes about individuals who actually want to have
2 their disease addressed in the legal setting on a
3 personal level. But we do know about the increased
4 risk, so I think I'm going to try to keep my answers to
5 we know there is increased risk.

6 Q. Even on a population basis, the phrase increases
7 the risk is not synonymous with the word causation, is
8 it?

9 A. Again, causation, we're talking about individuals
10 and increases the risk we're talking about a
11 population.

12 If you want to say what is the equivalent word in
13 the population that isn't increases the risk and you
14 want to use we know it causes this in populations, then
15 I would accept that, but I markedly prefer increases
16 the risk because I don't like that confusion where
17 somebody thinks that I'm advocating for an individual
18 thing. We're talking about population findings.

19 Q. The word causation is often applied in scientific
20 literature to talk about population-based exposures.
21 For example, tobacco exposure is a cause of lung
22 disease, asbestos exposure is a cause of mesothelioma
23 and other examples like that.

24 Correct?

25 A. Yes, you're correct.

1 Q. And I guess my question to you is increases the
2 risk is not synonymous with the word causation even at
3 a population level, is it?

4 A. I prefer to use the word increases the risk. But
5 if you prefer that I use the word causes, I can.

6 Q. It's not a preference. I'm just asking a
7 question. Are they ---?

8 A. They don't mean the same thing precisely. I
9 prefer to use increases the risk because it's a much
10 more accurate population statement.

11 Q. The West Virginia University C8 website that you
12 cite at the bottom of page seven of your report links
13 to another WVU Health Sciences Center page entitled C8
14 and Clinical Conditions and Diagnoses.

15 Correct?

16 A. You're challenging my memory. I have to go to the
17 website to be sure that it links to that.

18 Yes, that is the website of the Office of Research
19 and Graduate Education and it's a WVU site.

20 Q. And when you said, yes, that was a result of me
21 handing you Exhibit 8, which is entitled C8 and
22 Clinical Conditions and Diagnoses.

23 Correct?

24 ---

25 (Whereupon, Deposition Exhibit 8, C8 and

1 Clinical Conditions and Diagnoses, was
2 marked for identification.)

3 ---

4 A. Yes, that's correct.

5 BY ATTORNEY WOLFF:

6 Q. And in the first paragraph the WVU web page says
7 that none of the relationships between diagnoses and
8 corresponding population serum PFOA were C8 levels can
9 be taken to show an etiologic or a cause and effect
10 relationship or its absence without more work.

11 Correct?

12 A. Yes, that's --- this --- this was taken from
13 actually something that we wrote in 2000 --- I'm going
14 to say '07 or so, give or take a year, when we put the
15 website up and reflected the current state of
16 knowledge. And it's interesting to me that the Office
17 and Research and Graduate Education still has that
18 paragraph in there.

19 Q. As the WVU web page describes it, these data
20 concern associations.

21 Correct?

22 A. Yes.

23 Q. And the WVU web page goes on to caution the reader
24 that when it comes to causes, scientists interpret the
25 preliminary data with deference to additional work that

1 need to be done.

2 Correct?

3 A. Yes.

4 Q. Now, let's take a look again at Exhibit 1, which
5 is the August 2015 ATSDR CDC Tox Guide for
6 Perfluoroalkyls. And please turn with me to the second
7 page.

8 Under the heading health effects, which is in the
9 third column, toward the bottom, the ATSDR states a
10 large number of studies have examined the possible
11 relationship between levels of perfluoroalkyls in blood
12 and adverse health effects in workers, residents living
13 near manufacturing facilities and in the general
14 population. Although statistically significant
15 associations have been found, the studies do not
16 establish causality.

17 Additionally, the results were not always
18 consistent across studies.

19 Correct?

20 A. It does say that.

21 Q. Do you agree with that statement?

22 A. No.

23 Q. Why not?

24 A. I think there is sufficient evidence to implicate
25 a number of outcomes.

1 Q. What outcomes?

2 A. Well, should we go back to my report and --- or do
3 you want me to try to do it from memory or what's the
4 best way to go through this?

5 Q. If you need to refer to your report, refer to your
6 report.

7 A. Okay.

8 The ones that we want to --- do you have a
9 preference if I go through the ones that are the ones
10 we're monitoring for or do you want to go through the
11 list of outcomes that I think are established?

12 Q. The latter, the list of outcomes that you think
13 are established. So if you don't think they're
14 established, please don't recite them.

15 A. Okay.

16 So in my report there's --- I'll go from memory and
17 then I'll go back to the report to make sure I haven't
18 forgotten any. There's alterations in lipid metabolism
19 related to cholesterol and LDL. There's alterations in
20 uric acid metabolism. There's alterations in
21 pregnancy-induced hypertension. There's alterations in
22 liver functions. There's --- the mechanism behind
23 those things together is highly likely to be steatosis,
24 which is what's been found in multiple animal models,
25 as has the elevated cholesterol of the animals if the

1 right animal is fed the right diet.

2 There are also asthma and there's the cancer
3 outcomes, which include kidney cancer and testicular
4 cancer. I think the Science Panel implicated prostate
5 cancer as well. I'm kind of on the fence personally
6 about prostate cancer, but it's something that probably
7 would be a good thing to look for in both additional
8 studies and in monitoring populations to the degree
9 feasible. We didn't look for it in our proposal. And
10 we can go down --- we can go through why we didn't do
11 that at a later time unless you want me to start on
12 that now.

13 Let me go and see what I'm forgetting.

14 Q. Please.

15 A. I have to find a place in my report.

16 ATTORNEY WOLFF:

17 Why don't we just go off the record and
18 take a break.

19 VIDEOGRAPHER:

20 Okay.

21 Going off the record at 9:52 a.m.

22 OFF VIDEOTAPE

23 ---

24 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

25 ---

1 ON VIDEOTAPE

2 VIDEOGRAPHER:

3 Back on the record at 10:01 a.m.

4 BY ATTORNEY WOLFF:

5 Q. Dr. Ducatman, is there anything you would like to
6 add to your list based on a review of your report?

7 A. Yes, thank you.

8 Thyroid abnormality is something I've actually
9 published about is --- is in the list of --- found in
10 many studies.

11 I think I mentioned asthma already. There's an
12 increasing evidence of lower birth weight. Not every
13 study finds lower birth rate, but the more important
14 thing that follows lower birth weight that's coming out
15 in the literature now, which is not on my list and
16 will need to be attended to in the future is the
17 possibility, and it's not yet certain, of increased
18 evidence of obesity or difficulty with weight loss.
19 That's emerging literature. Shorter duration of breast
20 feeding --- I mentioned steatohepatitis, I think.
21 Excess ulcerative colitis. I can't recall if I
22 mentioned that or not.

23 Q. But you would put that on your list of things that
24 you believe have been established?

25 A. You're asking me about which one?

1 Q. Steatohepatitis --- all --- all of them, in
2 fact ---

3 A. Okay.

4 Q. --- that you're now going through.

5 A. Yes. Yeah.

6 Steatohepatitis is --- is --- is a underlying
7 mechanism which is seen in all of the animals, and it's
8 --- it is the overwhelmingly likely explanation for the
9 abnormalities of biochemical markers such as liver
10 function tests and lipids and uric acid seen in humans.

11 Osteoarthritis, there's literature about fecundity.
12 I'm a little uncertain about it at this point ---
13 delayed time to pregnancy. I --- I don't want to add
14 that to a --- a list of things. And then when it came
15 to by --- following this list, when it came time to
16 narrow it down to things that are really strong in the
17 literature and that have medical monitoring and other
18 things to recommend them, we have a shorter list of
19 things we're doing for the --- we're proposing to do
20 for the population.

21 Q. Are you done with your answer?

22 A. Yes.

23 Q. Do you subscribe to the principal that generally,
24 researchers should be conservative when it comes to
25 assessing causal relationships?

1 A. Yes.

2 Q. Is it fair to say in assessing causation,
3 researchers first look for alternative explanations for
4 the association, such as chance bias or confounding?

5 A. Right.

6 In fact, I've done a couple of papers that are
7 along that line.

8 Q. At the top of page 15 of your report, you state
9 that no one has been declared to have a PFOA associated
10 condition by any formal body.

11 Correct?

12 A. Yes, I did say that.

13 Q. What does it mean when you say that no one has
14 been declared to have a PFOA associated condition by
15 any formal body?

16 A. There is no formal body that has said to citizens
17 who are drinking contaminated water in Bennington, you
18 have this condition. And therefore, under some formal
19 agreement, you are said to have a condition that stems
20 from this --- this exposure.

21 That --- that's --- for example, in contrast to
22 what we have, for example, for Vietnam Veterans, where
23 there's a formal body that says to them, okay. You
24 have --- and picked whatever number of diseases. We
25 needn't get into the specifics.

1 But there's a list of diseases where if you have
2 that disease and you're part of a population where it's
3 known that population has exposure to
4 2378-Tetrachlorodibenzo-dioxin, you will therefore ---
5 it will be a --- a linkage will be made in a formal way
6 between your previous exposure many years ago and your
7 present condition.

8 Q. Would you describe the quality of the
9 epidemiological evidence between cigarette smoking and
10 lung cancer to be irrefutable?

11 A. Yes.

12 Q. Based on the published data, what is relative risk
13 between cigarette smoking and lung cancer?

14 A. It varies a little bit. It's usually around 10 or
15 11, if there isn't another risk factor. It's --- so
16 it's usually about a 10 fold increase.

17 Q. How would you describe the quality of the
18 epidemiological evidence between asbestos and
19 mesothelioma?

20 A. Also, you use the word irrefutable and I think ---
21 I think that's a good --- that's a good example. And
22 in addition, within my career and --- and not all that
23 long ago, I can remember reading many studies from
24 people who said well, the animals don't get
25 mesothelioma like humans. Therefore, these human

1 mesotheliomas aren't caused by asbestos. I can
2 remember reading more than a few articles like that.

3 And it just --- it illustrates a point you've made,
4 that we sometimes can't find the problem in the animal
5 until we do it right, and then they found it.

6 Q. Based on the published data, what is relative risk
7 between asbestos and mesothelioma?

8 A. Again, you know, people can argue about the
9 details and --- and I hope you'll give me some leeway
10 on the details, but it's usually around five. It's
11 usually considered --- mesothelioma, not lung cancer.

12 Q. Mesothelioma.

13 A. Oh, boy.

14 For --- for mesothelioma, that depends on how you
15 do it. But if you look at the cause, I mean something
16 like 70 to 80 percent of all mesotheliomas have
17 asbestos in their background. And we sometimes think
18 we just missed the others, but the --- the relative ---
19 mesothelioma is a disease of people who have been
20 exposed to asbestos. And I don't remember the exact
21 number. I apologize. I thought --- I --- I
22 incorrectly heard lung cancer where we know the number.
23 Mesothelioma, it's very high, but I don't know the
24 number.

25 Q. Can you compare and contrast the quality of the

1 epidemiological evidence between cigarette smoking and
2 lung cancer with the body of data on PFOA exposure and
3 kidney cancer?

4 A. Yes.

5 The --- we've been going for so many more years
6 about cigarettes, and lung cancer is so much more a
7 common condition. And the absolute certainty for lung
8 cancer is --- is not the case for PFOA and kidney
9 cancer. It is at this point, more likely than not.
10 The data support it. However, it --- it is reasonable
11 to believe that additional data could refute it in the
12 future. That is the nature of --- of epidemiologic
13 studies in humans.

14 Q. Compare and contrast the quality of the
15 epidemiological evidence between cigarette smoking and
16 lung cancer with the body of data on PFOA exposure and
17 testicular cancer.

18 A. There's a little bit more for testicular cancer,
19 including a lot of physiologic evidence. But the same
20 general answer pertains. It's not nearly as strong for
21 testicular cancer as it is for cigarette smoking. It's
22 just nowhere near as --- as strong.

23 Q. Compare and contrast the quality of
24 epidemiological evidence between cigarette smoking and
25 lung cancer with the body of data on PFOA exposure and

1 steatohepatitis?

2 A. The animal data are irrefutable. Animals get
3 steatosis when you give them PFOA, and they do it
4 routinely and they do it regularly. And I --- I'm
5 thinking that that's undisputed. I --- I would defer
6 to a toxicologist who can find someone who disputes it,
7 but I --- I believe it's undisputed.

8 In humans, because we're not going to liver biopsy
9 in person after person, and frankly won't be doing
10 that, what we have in humans is the animals do it and
11 the human biomarker data line up with it. And
12 therefore, it looks like that's the underlying
13 mechanism that --- that starts steatosis.

14 In addition, there are emerging marker studies in
15 human that show that both the DNA markers and the
16 immune markers and the cell damage markers line up with
17 steatosis. So it's pretty strong, but it's not at the
18 same level of --- as cigarette smoking and lung cancer
19 and --- and it may never be, because we're not going to
20 go in and do liver biopsies until people are very sick.

21 Q. Are you or are you not recommending medical
22 monitoring for prostate cancer in males in this case?

23 A. I'm not.

24 That doesn't mean that in some future thing, we'll
25 know some reason to change our minds. But at

1 currently, my --- my sitting down, thinking about it
2 and going through all the processes, I'm not
3 recommending it.

4 Q. Are you aware of any statement in the peer
5 reviewed scientific and medical literature which
6 reports that PFOA is a cause of kidney cancer in
7 humans?

8 A. I'm aware of a statement that says it's linked.
9 I'm aware of a statement that describes linked, but I'm
10 not aware of a statement that says it's a cause.

11 Q. Okay.

12 Are you aware of any statement in the peer review
13 scientific and medical literature which reports that
14 PFOA is a cause of testicular cancer in humans?

15 A. Same answer.

16 Q. Are you aware of any statement in the peer
17 reviewed scientific and medical literature which
18 reports that PFOA is cause of steatohepatitis in
19 humans?

20 A. I have to think about that pretty carefully.
21 There are statements that DNA markers are there. There
22 are statement that the biomarkers are there. There are
23 clear statements that the animals get it. And my
24 memory is not good enough to say yea or nay if somebody
25 has said we think, you know, it's in humans. It's ---

1 it's the consensus explanation at this point for what
2 underlies these biomarker abnormalities that are in
3 humans, and that I recommend we follow.

4 Q. Are aware of any statement in the peer reviewed
5 scientific and medical literature which reports that
6 PFOA is a cause of any particular disease in humans?

7 A. I --- I think that if we look at the literature,
8 if it doesn't say that PFOA is causing people to take
9 more --- to need to take more medication for lipids. I
10 --- I believe the literature actually states that very
11 clearly and that's a code of diagnosis. So that's the
12 one where, you know, depending on what you mean by
13 statement, I think the answer could be yes or no
14 depending on how you define statement.

15 I think there's emerging literature that you are
16 more likely to be diagnosed with gout. So again, you
17 know, depending on what you say is a diagnosis, I think
18 it could be there. And I think when you look at the
19 differences, if it doesn't already say that, you know,
20 it's a question of when it will.

21 I think it probably does say something like that
22 for cholesterol and it may already for gout. But if it
23 doesn't, it will soon. And I think it's more likely
24 than not for the others, but I'm not aware of
25 statements because the literature is slimmer.

1 Q. Okay.

2 Based on the published literature, can you
3 identify the doses --- the dosage of exposure to PFOA
4 in terms of concentration and duration that is required
5 before you would expect to see signs and symptoms of
6 gout?

7 A. I haven't seen the dose response curve, so I can't
8 --- I mean I --- I --- I looked at that in literature
9 we published. But that literature was not adequate to
10 say we know that we have this threshold or there is no
11 threshold.

12 Okay? We --- I --- I don't think there were enough
13 cases for hyperuricemia to do that. And that ---
14 that's hyperuricemia and not gout literature. For the
15 emerging gout literature, I don't know the answer to
16 your question.

17 Q. Based on the published literature, can you
18 identify the dosage of exposure to PFOA, in terms of
19 concentration and duration, that is required before you
20 would expect to see signs and symptoms of the lipid and
21 cholesterol abnormalities that you described a moment
22 ago?

23 A. Yes. We --- we actually do have that in the
24 literature, and you can see it in the --- in the
25 exposure responses in several papers where --- you can

1 look at the figures. And they're --- actually, an
2 issue is that, you know, you don't know what the lower
3 threshold is because it was kind of defined by the
4 technology at the time in a large population. But we
5 can't see --- if you go from two to five, you can start
6 to see it.

7 Q. Two to five what?

8 A. So those are nanograms per liter --- micro ---
9 usually, human reporting doses --- and I always have to
10 look them up because that's a weakness I have. So it's
11 --- it's a really small number. It tends to be about
12 --- you know, if people are drinking water at a steady
13 state, it tends to be about a tenth of what's in their
14 drinking water. But as you correctly pointed out,
15 there are huge variations around that mean.

16 Q. And what's the duration of the exposure? So you
17 gave me the concentration.

18 A. Right.

19 Q. What's the duration?

20 A. You know, we don't know the answer because people
21 have been drinking this stuff for different periods of
22 time. But I'll tell you this, you can see it in
23 children. So it can't be all that long. It takes
24 ---you don't --- you don't see it in the youngest of
25 the young children. In fact, what you actually see is

1 opposite at first, it looks like, although we're not
2 sure of that. And then it turns around and the kids
3 begin to go up. So it's not vast amounts of time and I
4 can't give you a more --- a better thing except to say
5 we do see it in children.

6 Q. Okay.

7 Just want to talk for a moment about regulatory
8 risk assessments.

9 While everything is toxic at some dose, the
10 exposure levels calculated in a regulatory risk
11 assessment do not tell you what that dose is.

12 Do they?

13 A. It's an interesting question because it poses the
14 issue backwards. So the usual way a risk assess ---
15 let's stipulate I'm not a risk assessor.

16 Q. Okay.

17 A. I work with information from risk assessors. I
18 would be a terrible risk assessor.

19 What risk assessors do very basically, is they find
20 a threshold dose.

21 Okay? Which is very responsive to your question.
22 So they say in the literature right now, this outcome
23 at this dose is the lowest thing we see.

24 Okay? And that tends to only get lower over time.
25 It's very rare for that ever to get higher for a toxin.

1 New information comes out, it gets lower. And then
2 based on that dose and based on the route of exposure
3 and based on the outcome and based on something called
4 uncertainty factors which has to do with how much
5 information we have, you come up from that to the
6 regulatory issue.

7 Now the regulatory number is the outcome of that.
8 It's not the precipitating cause of those numbers. You
9 asked the question sort of backwards to that.

10 Q. Given the methods, the assumptions and the safety
11 factors that are used in regulatory risk assessments,
12 the permissible exposure levels that are calculated are
13 intended to be protective and not predictive.

14 True?

15 A. Yes.

16 Q. Given the methodology assumptions and safety
17 factors that characterize regulatory risk assessments,
18 the permissible exposure levels do not provide
19 predictive information about actual clinical risk or
20 medical causation for exposures that exceed such
21 levels.

22 Do they?

23 ATTORNEY WHITLOCK:

24 Object to the form.

25 A. Yeah. Again, that's the same --- it's the same

1 backwards formulation. So the --- the --- the
2 regulatory level is not predictive. However, depending
3 on the type of data that's available, some of the data
4 can be. It depends on what's available.

5 BY ATTORNEY WOLFF:

6 Q. In your report, you do not recite any point
7 estimates, relative risks or confidence intervals for
8 any health end points including kidney cancer,
9 testicular cancer, asthma or steatohepatitis.

10 Do you?

11 A. That's correct.

12 Q. Why didn't you recite any of those in your report?

13 A. They're --- they're in the literature. The
14 literature is referenced, and I just didn't think that
15 there was a need to add to what's in the literature
16 beyond the --- beyond the findings that are there.

17 Q. Beyond providing summary statements, some of which
18 are as short as one word and some of which are up to
19 two sentences, you do not discuss, analyze or explain
20 the methodological limitations or the particular data
21 from any of the studies that you cite through endnotes
22 on pages five and six of your report.

23 Do you?

24 ATTORNEY WHITLOCK:

25 Object to the form.

1 A. Could you repeat the question?

2 BY ATTORNEY WOLFF:

3 Q. Sure.

4 You do not discuss, analyze, or explain the
5 methodological limitations or the particular data from
6 any of the studies that you cite through endnotes on
7 pages five and six of your report.

8 Do you?

9 A. No.

10 Q. Why not?

11 A. I didn't think it was needed. We were dealing
12 with excess risk, and the excess risk is present and I
13 thought that was what I was asked to do.

14 Q. Asked to do by whom?

15 A. By Plaintiff's attorneys.

16 Q. The studies that you cite on pages five and six of
17 your report are not the totality of the published
18 studies from PFOA exposed human populations on each of
19 those end points.

20 Are they?

21 A. No, there's probably another group of studies.
22 It's --- it's a lot of them. At some point, you run
23 out of gas. Some of them are not that relevant because
24 they studied the wrong population or at the wrong dose,
25 but there are others.

1 Q. Are the particular studies that you cite for each
2 of the end points listed on pages five and six of your
3 report, the studies that you think support your
4 opinions?

5 A. In some cases, they're not fully supportive. In
6 many cases, they are supportive. And there are other
7 studies in some cases that are supportive. And studies
8 that I thought were less important, I didn't include.

9 And then you're asking, I think, about studies that
10 are not supportive. And there some in the literature,
11 and I didn't include them. And for the most part, I
12 don't think that they're very relevant either.

13 Q. Let me just frame the question.

14 Do you cite the studies containing data that do
15 not support or are inconsistent with the propositions
16 you advance on pages five and six of your report?

17 A. Actually, some of these are in some ways
18 inconsistent.

19 Q. How is that?

20 A. They don't always show that the --- that the dose
21 response curve is exactly the same way we found it.

22 Okay? There are differences in the dose response
23 curve. There are differences in which perfluoroalkyl
24 substance is the most powerful. It's often the one
25 that's sort of a rule of thumb. It's not always true,

1 but it's often true.

2 At the higher dose --- when you get into the higher
3 dose populations, the dominant perfluoroalkyl substance
4 is the one that looks like it's the baddie, and other
5 is less, which may be consistent with a --- saturation
6 mechanism, some people think. But we don't know.

7 So it's --- they're --- they're --- they're not ---
8 you know, it's --- it's not always fully supportive,
9 but I also didn't cite, to be clear, the ones that I
10 think were less important, the ones that were out in
11 the way upper range of the exposure where it tends to
12 attenuate. It still goes up, but not enough that you
13 can see it in the size population that it was done,
14 things like that.

15 Q. What were the inclusion and exclusion criteria, if
16 any, for the studies you cite on pages five and six of
17 your report?

18 A. I thought they were the best in class.

19 Q. What method did you use to reach the opinions in
20 your report?

21 ATTORNEY WHITLOCK:

22 Object to the form, vague and ambiguous.

23 A. The way we --- you're asking me about a literature
24 search strategy?

25 BY ATTORNEY WOLFF:

1 Q. However you would describe it, so that's a pretty
2 broad question, but it's the one way I know how to ask
3 it. What method did you use to reach the opinions in
4 your report?

5 A. So for each of these questions, there is a --- a
6 literature. That literature came almost completely ---
7 there are a couple of exceptions we found in the United
8 States National Library of Medicine where you can use
9 specific search terms with specific operators to find
10 --- or everything or to narrow down on the thing you
11 want.

12 You pull up all of those and you look at the ones
13 that address the question that you're asking, and then
14 you cite the ones that you think are the best within
15 those groups.

16 Q. Anything else?

17 A. I --- I absolutely think there are other things
18 that I do as a matter of intuition, but you may have to
19 ask me a more specific question for me to tell you what
20 else you --- you mean in your very broad question.

21 Q. The phrase consistently established does not have
22 any recognized or generally accepted definition in the
23 medical and scientific community.

24 Does it?

25 A. I --- I don't know the answer to that. I'm not

1 aware that it does, so we'll leave it at that.

2 Q. Fair enough.

3 In your opinion, how long would a person have to
4 drink water containing PFOA to be at a significantly
5 increased risk of a serious latent disease?

6 A. That's ---.

7 ATTORNEY WHITLOCK:

8 Object to the form.

9 A. That's actually an important question, and I don't
10 think it's just like a few weeks, even if it's a high
11 dose. I --- based on the physiology, it looks like
12 it's got to be for a period of time.

13 Okay? You know, you could --- any time period you
14 pick is arbitrary. If you say it's 365 days, someone
15 will argue it's 364 and someone else will say it's 366.

16 But I don't think that if you drink a bunch of PFOA
17 all at once --- you know, may make you sick. You know,
18 you may not feel good for a day. I don't think that's
19 what we're looking at in the people who have
20 abnormality. I think it takes time to develop, even at
21 high dose.

22 BY ATTORNEY WOLFF:

23 Q. Right.

24 So I'm not asking you to debate with anybody else
25 at the moment. And I know that you said that there were

1 some would say --- you 365, someone else will say 364.

2 Okay? Let's put those folks aside. In your
3 opinion, Alan Ducatman's opinion, how long would a
4 person have to drink water containing PFOA to be at a
5 significantly increased risk of a serious latent
6 disease?

7 ATTORNEY WHITLOCK:

8 Object to the form.

9 A. The --- the --- the question is --- is
10 unanswerable because of course, we don't know.

11 Let's --- let's do it as a practical answer. If I
12 were to choose a cutoff based on what we do and don't
13 know and --- and in terms of how long we mostly don't
14 know, I would choose a cutoff of a year.

15 Okay? That's just a practical matter because I
16 don't think --- you know, let's say that something goes
17 wrong and one of the products that you're using gives
18 you a really big bolus of PFOA. Well that's not how
19 people bioaccumulate. And --- and this is about
20 bioaccumulation in people, and bioaccumulation is
21 something that takes time and invokes our own
22 metabolism. And so I know it's not a day. I don't
23 think it's a month, so I chose a year.

24 Okay?

25 BY ATTORNEY WOLFF:

1 Q. If there is a risk associated with drinking water
2 with PFOA, then the risk is different from individual
3 to individual because their consumption of water is
4 different.

5 Correct?

6 A. Well that's one way to look at it. But the other
7 way to look at it is we can measure the
8 bioconcentration in people and at that point, it's
9 their bioconcentration.

10 Q. Assuming there is a risk associated with PFOA
11 exposure, if you were to look at any individual class
12 member among the thousand or more individuals in this
13 proposed class, the risk to that individual is going to
14 be affected not only by the amount of water, but also
15 by the amount of PFOA in the water he or she has
16 consumed.

17 Correct?

18 A. Yes, that's correct.

19 Q. Is it fair to say that the risk of disease, if
20 any, is not proportional to the difference in the
21 amounts of water consumed because different individuals
22 have different susceptibilities to PFOA based on their
23 medical conditions and other behavioral factors ---?

24 A. I --- I think you're right. But the question is
25 pretty the long, so could you repeat it? Just ---.

1 Q. I want you to be sure.

2 Is it fair to say that the risk of disease, if
3 any, is not proportional to the difference in the
4 amounts of water consumed because different individuals
5 have different susceptibilities to PFOA based on their
6 medical conditions and other behavioral factors?

7 A. Well I ---.

8 ATTORNEY WHITLOCK:

9 Object --- excuse me.

10 I'm going to object to the form to the
11 compound question, and it's vague and ambiguous.

12 Now you may answer.

13 A. The --- the first part of that actually, now that
14 I've heard the whole thing, so there's about two to
15 three different questions in there, and one piece of it
16 is wrong.

17 BY ATTORNEY WOLFF:

18 Q. Which piece is wrong?

19 A. The --- the bit about the concentration in water.
20 You should repeat that because it doesn't make sense.

21 If you read the whole question, I'll write down the
22 part that doesn't make sense.

23 Q. Okay.

24 Is it fair to say that the risk of disease, if
25 any, is not proportional to the difference in the

1 amounts of water consumed because different individuals
2 have different susceptibilities to PFOA based on their
3 medical conditions and other behavioral factors?

4 A. Okay.

5 So ---.

6 Q. So what part --- what part did I get wrong?

7 A. It --- it's --- I'm trying to parse the double
8 negative.

9 Q. Okay.

10 A. And there is a double negative in there.

11 ATTORNEY WHITLOCK:

12 There's a double negative, there's four
13 questions. There's ---.

14 A. Yeah.

15 But when you say it's not proportional --- and I'm
16 paraphrasing, I may not have it exactly --- not
17 proportional to the difference in the amount of water
18 consumed --- well actually, the dose --- the exposure
19 dose is going to be --- people will have different
20 concentrations in their serum, but the exposure dose
21 will be proportional.

22 So your --- your question has an incorrect piece in
23 the middle of it that makes it's just --- or not ---
24 maybe misleading or difficult, and so you --- you
25 should probably just ask that question because you may

1 mean something important. But you --- you can't do
2 that proportion thing where the dose in the water
3 somehow doesn't matter.

4 BY ATTORNEY WOLFF:

5 Q. But the dose in the water does matter because ---

6 A. Right.

7 Q. --- because there are differences from well to
8 well to well.

9 Right?

10 A. Right.

11 That --- but your question don't say that.

12 Q. Is it fair ---?

13 A. Your question's got the double negative in there
14 that doesn't say that when you parse it.

15 Q. Okay.

16 I'm not sure where the double negative is, but I
17 --- I think we've spent enough time on this one.

18 Is it fair to say that individuals who are not
19 exposed to PFOA through their home's water supply
20 because for example, they're hooked up to the municipal
21 water system in Bennington, do not have that component
22 of PFOA in their PFOA body burden. And thus, their
23 risk of exposure, if any, is less than those
24 individuals who have PFOA in their home's water supply?

25 A. It's mostly correct, but it will be incorrect in

1 some cases. And so --- so if you look at the C8 health
2 study, if you worked, if you went to school --- so I
3 don't have any information that any business was on a
4 well. I don't have any information that a school was
5 on a well. But since I don't have that information,
6 the point isn't where you live, so much as were you in
7 a place where you drank the water for a substantial
8 period of time?

9 And so your question is mostly correct.

10 Q. Is an alteration in a biochemical marker itself a
11 clinical pathology?

12 A. So you --- you were good until you used word
13 pathology, which is usually histopathologic. But let's
14 use the word clinical disease.

15 Okay? And then the answer is, it depends. So it
16 depends on the marker. Some of them, they're only
17 markers of disease. And some of them, they are the
18 disease, so it depends.

19 Q. Fair answer.

20 In --- in your opinion, are small but
21 statistically significant increases in liver
22 biochemical tests clinically significant?

23 A. Good question. I like that one.

24 Not necessarily in one individual at one time.

25 In populations, they are very significant for

1 indicating what's going on and that's where they become
2 very useful in a population. And then you can go back
3 and use them for screening. Also there's increasing
4 information that you can use them for screening.

5 So let's take the normal cut off of ALT. Okay?
6 Which is a liver biomarker. And say the normal cutoff
7 at my lab is 40 or 50, choose whichever one you want.
8 And say that my number, my personal number, is 30. So
9 I'm clinically normal. What that means is that I'm
10 within the distribution of 95th percentile. It doesn't
11 say much about my liver.

12 Now we start to get interested in the past five
13 years about the --- the epidemic of steatosis in our
14 society, something like more than 20 percent and fewer
15 than 40 percent already have steatosis. Looks like
16 this increases the risk associated mostly with obesity.

17 If you no longer go by 40 and you take other
18 cutoffs, people are finding this very useful. Okay?
19 So the population research actually led to reevaluation
20 of the marker.

21 Q. In your opinion, does every instance of an
22 abnormal liver biochemical test constitute a disease?

23 A. No.

24 By definition ---- you --- you know the answer to
25 that. By definition, an abnormal liver biochemical

1 test isn't a disease. And furthermore, even one
2 abnormal cholesterol test isn't a disease. We have to
3 be sure that you're going to do it frequently before we
4 start to treat you for your high cholesterol.

5 Q. Right.

6 So if you're going to be put on a statin, most
7 physicians would want to see a second cholesterol test?

8 A. Most would.

9 Q. Similar results?

10 A. Yeah, most would.

11 They might not if --- you know, they might not if
12 --- if your --- if your --- if your whole family had
13 just died at a young age. But most of the time, they
14 would repeat it and that would be a prudent thing to
15 do.

16 Q. And once they've got the repeat test, they put you
17 on a statin and pretty much you're taking a statin for
18 the rest of your life.

19 Right?

20 A. Until you get disgusted with taking it and stop,
21 which is one of the problems.

22 Q. Got it.

23 At the bottom of page three of your report, you
24 state that the mean background blood serum level in the
25 U.S. population of 2.1 micrograms per liter.

1 Right?

2 A. At the --- yes.

3 That --- that --- that was the mean background
4 level circa --- I'm trying to remember the time, but
5 it's one of the NHANES reports.

6 Q. Yeah, 2011 to 2012, that was the geometric mean.
7 Correct?

8 A. That's correct. That sounds correct. I think
9 you're right about the years.

10 Q. And we'll go through them.

11 In the second paragraph of Page Nine of your
12 report you make reference to Bennington residents who
13 have above background levels of PFOA in their blood.

14 Correct?

15 A. Yes.

16 Q. I'm not fussing when you say this, but your report
17 does not actually specify the cut point for what you
18 consider to be background levels of PFOA in blood.

19 Does it?

20 A. This report or the other one? I don't remember,
21 but if it --- if it doesn't I was thinking about 2.1 at
22 this time.

23 Q. So for purposes of your opinion in this case what
24 do you consider the cut point to be for background
25 levels of PFOA in blood?

1 A. Well, since I wrote this report NHANES published
2 another. And there was a --- a disappointingly small
3 decrease --- I mean, it's actually --- people are not
4 coming down the way we hoped. But there is a tiny
5 decrease in --- you're going to test my memory here.
6 I think it's like 1.96 now.

7 If I'm off by, you know, a couple hundredths I
8 apologize, because --- but I did the report at 2.1 and,
9 you know, that's what I was thinking when I did the
10 report.

11 Q. Then let's use 2.1 as the --- as the cut point.

12 Okay? I just --- I need to have a sort of a
13 common thing to point to. 2.1 is what you intended
14 when you wrote your report?

15 A. When I wrote that report I intended 2.1.

16 Q. Okay.

17 So when you wrote your report and you made
18 reference to Bennington residents who have above
19 background levels of PFOA in their blood you meant
20 residents who have greater than 2.1 microliters of PFOA
21 in their blood.

22 Correct?

23 A. That's what I meant when I wrote the report
24 honestly.

25 Q. And then --- yeah, okay.

1 And then in the same paragraph on page nine of
2 your report you go on to assert that, to a reasonable
3 degree of medical certainty a medical monitoring
4 program is clinically necessary for this population to
5 detect known PFOA-related adverse health effects as
6 early as possible, in order to minimize disease and
7 improve health outcomes. That's what you wrote.

8 Correct?

9 A. Yes, that sounds right.

10 Q. So to be clear, your inclusion criteria for what
11 you describe as a clinically necessary medical
12 monitoring program is anyone who has more than the
13 NHANES background levels of 2.1 microliters of PFOA in
14 their blood.

15 Correct?

16 A. It's actually not that simple. But what I
17 thinking --- but that's a fine cut point.

18 Q. What were you thinking?

19 A. It just so happens as we've already discussed that
20 if you look at the large population profiles for lipids
21 and perfluoroalkyl substances you can see the --- I
22 mean, it may happen lower. Actually it looks like it
23 happens lower if you look at the curve.

24 You probably assume it happens lower, but you
25 can't see because the technology wasn't there. But if

1 you go from two to five it goes up.

2 Q. How can one tell which Bennington residents do or
3 do not have more than 2.1 microliters of PFOA in their
4 blood?

5 A. I personally can't look at you and tell what your
6 perfluoroalkyl substance is by --- by any means other
7 than by testing.

8 Q. So each individual living in Bennington would need
9 to be tested to determine whether they have more or
10 less than 2.1 microliters?

11 A. Well, we've already had a little bit of this
12 confusion about all of Bennington versus the people who
13 have contaminated water.

14 Q. Okay.

15 A. So let's --- let's stick with this population.

16 Q. Okay.

17 This --- so --- fair enough. So in order to
18 determine who in this population has more than 2.1
19 microliters of PFOA in their blood each individual
20 would need to have a blood test?

21 A. I think many have had, but perhaps not all. And
22 it would be very appropriate to test folks to find out.
23 You know, you --- there's one other way to look at it
24 and I know epidemiologists who actually prefer the
25 models --- and the thing --- the nice thing about the

1 model from an epidemiologist's perspective is you can
2 start looking at the thing that you already mentioned,
3 which is the variation in the water. Very likely it
4 was higher at some time, but maybe it wasn't. Maybe,
5 you know, we have to model it and you get some idea of
6 what was in their blood over time.

7 Because I'm a clinician I'm very comfortable with
8 the idea. We measure it in your blood and that
9 integrates your exposure and that's your exposure.
10 Because it's very concrete. I don't have to deal with
11 a whole lot of math where people can argue.

12 Q. Let's take a half step back, just a general
13 question. You are aware that NHANES periodically
14 conducts and publishes the results of blood sampling.

15 Correct?

16 A. Yes.

17 Q. Is it fair to say that NHANES collects and
18 publishes data on human exposure to some 265
19 environmental chemicals?

20 A. I don't know the number, but I'll take your word
21 for it.

22 Q. Fair enough.

23 A. And, you know, the --- the chemicals vary by the
24 way, even within the PFOA substances from test date to
25 test date.

1 So it's not like it's this --- you mentioned 265.
2 It's not like you could say in 2004 it's the same
3 chemicals as in 2011 or 2014.

4 Q. And I'm just going to get into that. Okay.

5 ---

6 (WHEREUPON, THERE WAS AN OFF RECORD DISCUSSION.)

7 ---

8 BY ATTORNEY WOLFF:

9 Q. Dr. Ducatman, Exhibit 9 contains the PFOA blood
10 data tables from the February 2015 NHANES Fourth
11 National Report on Human Exposure to Environmental
12 Chemicals.

13 ---

14 (Whereupon, Exhibit 9, February 2015
15 PFOA Blood Data Tables, was marked
16 for identification.)

17 ---

18 BY ATTORNEY WOLFF:

19 Q. Please turn with me to page 338, which is the
20 last page on this Exhibit, which contains the sampling
21 results for PFOA from 2011 to 2012. Are you there?

22 A. Yes.

23 Q. And in the top line the geometric mean for the
24 total sample is 2.08 micrograms per liter, which
25 rounded up to the first decimal is your number of 2.1

1 micrograms per liter.

2 Correct?

3 A. Yes.

4 ATTORNEY WHITLOCK:

5 Object to the form.

6 A. I --- I --- I already mentioned that I might be a
7 couple hundredths off, but I just --- you you have to
8 remember a number.

9 BY ATTORNEY WOLFF:

10 Q. I'm not fussing at you. I just want to make sure
11 we're talking about the same data set.

12 A. Right. It's --- and it's a geometric mean and not
13 a mean. And you may have said mean, which I didn't
14 catch at the moment. But in any case it's --- it's a
15 median. It's a --- it's a central tendency.

16 Q. Okay.

17 And please turn to page 336 which contains the
18 sampling results for PFOA from five different surveys
19 taken between 1999 and 2010.

20 Correct?

21 A. Yes.

22 Q. And with the exception of the 2007 to 2008
23 sampling period in each successive survey the geometric
24 mean is going down from the prior survey.

25 Correct?

1 A. Yes.

2 Q. And so for 1999 to 2000 the geometry metric mean
3 was 5.21.

4 Correct?

5 A. Yes.

6 Q. For 2003 to 2004 the geometric mean was 3.95.
7 Correct?

8 A. Yes.

9 Q. From 2005 to 2006 the geometric mean was 3.92.
10 Correct?

11 A. Yes.

12 Q. From 2007 to 2008 the geometric mean was 4.12.
13 Correct?

14 A. Yes.

15 Q. And from 2009 to 2010 the geometric mean was 3.07.
16 Correct?

17 A. Yes.

18 Q. And as we know for 2011 to 2012 the geometric mean
19 was 2.08.

20 Correct?

21 A. I think that's right.

22 Q. Now since your inclusion criteria for what you say
23 is a clinically necessary medical monitoring program,
24 is anyone who has more than the background of 2.1
25 micrograms per liter you would say that millions and

1 millions of Americans should have been getting this
2 medical monitoring as a clinical necessity in 1999 to
3 2000 when the background level was 5.21, which is two
4 and half times higher than 2.1.

5 Correct?

6 A. Yeah.

7 ATTORNEY WHITLOCK:

8 Object --- object to the form.

9 A. It would have --- your question is, would it have
10 been desirable for these people to ---.

11 BY ATTORNEY WOLFF:

12 Q. Have that medical monitoring program?

13 A. Yes, it would have been.

14 Q. And the scientific data do not demonstrate that
15 2.1 micrograms per liter of PFOA is a threshold dose
16 for causing any disease in humans.

17 Do they?

18 A. You mean, it could be lower? It could be.

19 Q. The scientific data did not demonstrate that
20 something less than 2.1 micrograms per liter of PFOA is
21 a threshold dose for causing any disease in humans. Do
22 they?

23 A. We don't know that. Right. Yeah, correct.

24 Q. Okay.

25 Now let's use the 1999 to 2000 geometric mean as

1 an example. The scientific data do not demonstrate
2 that 5.2 micrograms per liter of PFOA is a threshold
3 dose for causing any disease in humans. Do they?

4 A. What we know about 5.2 is that we can see that
5 your cholesterol goes up. And we also know that the
6 very assiduous search for confounders has been made in
7 multiple ways and not found. We also know that the
8 right animal fed the right diet will get the same
9 result.

10 So I believe that it's much more likely than not
11 that we do know that people are more likely to need to
12 take lipid lowering medications at that dose.

13 Q. Other than being an average background level 2.1
14 micrograms per liter of PFOA has no established
15 clinical significance. Does it?

16 A. For environmental chemicals we just generally
17 don't say that a level has a clinical significance. We
18 --- we --- there are regulatory significances. And
19 sometimes they're --- they're, you know, well known
20 like, you know, the cut off for children in lead. And
21 there are regulatory --- so that's a biomarker. And
22 there's regulatory thresholds for exposures. But we
23 don't say that if you're above this level even for
24 something as toxic as lead that we know you're going to
25 be sick.

1 Q. Other than being an average background level 2.1
2 micrograms per liter of PFOA has no established
3 scientific significance. Does it?

4 A. Well, again what we know is that when you go from
5 two to five you can see in both adults and children
6 that the serum lipids are going up.

7 We also know that --- here's the neat thing, if you
8 take a population where it's going down serum lipids
9 are coming down at --- I mean, you have to model
10 against age. You have to do that because as we age our
11 lipids get worse but the cholesterol and LDL are
12 getting better when it comes down --- and that study's
13 been done too.

14 Q. When considering risk are dose and the attendant
15 hazard important factors?

16 A. Yes.

17 Q. Dr. Ducatman, Exhibit 10 is a transcription of the
18 ATSDR/CDC's January 2017 PFAS Continuing Education for
19 Clinicians, which is available on video through the
20 ATSDR's website and which contains subtitles.

21 ---

22 (Whereupon, Exhibit 10, January 2017
23 ATSDR/CDC Transcript, was marked for
24 identification.)

25 ---

1 BY ATTORNEY WOLFF:

2 Q. And to be clear, our word processing department
3 prepared this transcription off of that video and its
4 subtitles. I just want you to understand how this
5 document came to be.

6 Okay?

7 A. Thank you.

8 Q. And if you would please turn with me to page 28?
9 Are you there?

10 A. Yes.

11 Q. As recently as 2017 the ATSDR/CDC has told
12 clinicians that there is no health screening
13 recommended because of exposure to PFOA.

14 Correct?

15 A. Right. They're going --- there are no official
16 guidelines.

17 Q. And please turn with me to page 27. And we're
18 going to take this in stepwise fashion.

19 Okay? Are you there?

20 A. I'm here.

21 Q. Okay.

22 As recently as 2017 the ATSDR/CDC has told
23 clinicians that PFAS are ubiquitous in both the U.S.
24 and globally. There are no specific biomarkers of
25 health effects caused by or linked to PFAS blood

1 concentrations.

2 The presence of PFAS in blood testing only
3 confirms exposure, which is present in greater than 95
4 percent of the U.S. population, based on representative
5 samples from NHANES studies.

6 Correct?

7 A. That's what was written there.

8 Q. Do you agree with that statement?

9 A. I agree with parts of it.

10 Q. What parts do you not agree with?

11 A. When they say there are no specific biomarkers of
12 health effects I'm not sure I know what they mean. If
13 they --- if they mean that PFAS is not linked with
14 elevated total cholesterol that literature is pretty
15 clear that they're wrong. So it's unclear to me what
16 they mean by that.

17 What I agree with is the statements that PFAS are
18 ubiquitous in both the U.S. and globally. If there are
19 places where people don't have PFAS in them it's got to
20 be both a pretty remote place and a place where people
21 aren't eating any seafood because PFAS gets into
22 certain types of seafood --- various PFASs get into
23 certain types of seafood. So in places as remote as
24 the Faroe Islands, people have PFAS in them.

25 And the presence the PFAS in blood testing only

1 confirms exposure which is present in 95 percent of the
2 U.S. population based on representative samples. And I
3 agree with that, the presence confirms exposure. But I
4 don't know what they mean by only.

5 Q. Let's continue. The ATSDR/CDC further states
6 that, while higher blood concentrations of PFAS suggest
7 larger exposures PFAS blood concentrations cannot be
8 linked to any specific health effects. And results
9 obtained from testing patients blood PFAS
10 concentrations would not guide medical decision making.

11 Correct?

12 A. It does say that.

13 Q. And the ATSDR further states that, even if a
14 patient is identified as having an extremely high PFAS
15 blood concentration this does not mean he or she will
16 suffer from any adverse health effects.

17 Correct?

18 A. It says's that, yes.

19 Q. Do agree with that statement?

20 A. Which one?

21 Q. Either of the two that we just read.

22 A. Okay.

23 I --- I agree with the second one. It is possible
24 to have a very high PFAS serum concentration and
25 nothing bad may happen. That --- that is certainly

1 possible. And we know that from other environmental
2 exposures. You can work with dioxin and not get one of
3 dread diseases. You can smoke cigarettes and lead a
4 long life. It's unwise, but you can do it.

5 The one I disagree with and you anticipated this,
6 is that they cannot be linked to any special health
7 effects. I actually think the literature is very clear
8 and I think that this statement's going to be a black
9 eye for ATSDR. And it's only a matter of time before
10 they get tired of trying to defend it.

11 ATTORNEY WHITLOCK:

12 Just so the record's clear I'm just going
13 to object to the inference ATSDR and CDC continue,
14 given the transcription. I don't --- I --- I certainly
15 am not questioning that it was accurately transcribed.
16 I just have no way of verifying that.

17 You could --- Counselor, you're welcome to
18 read --- read from it and ask Dr. Ducatman whether he
19 agrees or disagrees and --- and you can --- and you're
20 welcome to continue attributing it ATSDR/CDR. But I
21 just wanted to make that clear on the record.

22 ATTORNEY WOLFF:

23 Okay. And we noted the link on the first
24 page.

25 BY ATTORNEY WOLFF:

1 Q. Okay.

2 Dr. Ducatman, let's just finish with this page.
3 The ATSDR/CDC further states that, likewise patients
4 with mildly elevated PFAS blood concentrations are not
5 immune from exposure-related health risks.

6 Management of patients exposed to PFAS should be
7 guided solely by patient symptoms and findings derived
8 through a health history and physical examination.

9 Correct?

10 A. Yes, it say's that.

11 Q. Do you agree with that statement?

12 A. So there's two statements there. Let's go --- is
13 it okay if I do them separately?

14 Q. However you wish.

15 A. Thank you. So patients with mildly elevated blood
16 concentrations are not immune from exposure-related
17 risks, with the exception that they shouldn't have used
18 word immune. Because immune means something else.

19 I agree with the direction they're taking that
20 statement. You --- you --- if you are exposed you can
21 have health outcomes. That's what they're saying.
22 They're just saying it in the negative. And they
23 shouldn't have used the word immune.

24 By the way, if I forgot to include immune in my
25 first list of things I should have. You just reminded

1 me. Because we know that ---.

2 Q. So I just ---- so the record is clear, what is
3 your first list of things?

4 A. Yeah, immune is on it.

5 Q. No, no. No, what --- what --- what were you
6 intending to describe on your first list of things?

7 A. Yes, that was the question that you asked me.

8 And I can't remember if I added immune. But if I
9 didn't it should be there.

10 Q. Yeah, but are ---?

11 A. There are immune --- there are immune findings.

12 Q. Okay.

13 Now let me --- let me ask it this way. Are immune
14 findings findings that you would say have been
15 demonstrated in humans?

16 A. Yes, absolutely.

17 Q. Okay.

18 A. There's zero doubt to that at this point.

19 Q. I just wanted to get clarity on what we were ---?

20 A. Yeah, and if I --- if I forgot I apologize.

21 Q. Yeah, I ---.

22 A. There's no doubt of it. It's --- it's kind of,
23 you know, when you're on a seat for like more than an
24 hour you just, you know --- sometimes you just don't
25 remember everything. But back to this.

1 Q. Okay.

2 Back to this. I'm not fussing at you. Are you
3 done with your answer on page 27 or ---?

4 A. No.

5 Q. Okay. Then please continue.

6 A. There's a second sentence there.

7 Q. Okay. Go ahead.

8 A. Management of patients exposed to PFAS should be
9 guided solely by patient symptoms and findings derived
10 from a thorough health history and physical
11 examination.

12 And here I --- I mostly agree. Because what
13 they're talking about when they use the word management
14 is they're talking about what happens between you and
15 your doctor. Okay?

16 But somebody reading this sentence could infer that
17 your doctor actually knows what to do with PFAS levels.
18 And actually we know that's not the case. And so it's
19 --- it's got to be also based on what we find out about
20 your exposure. And then will your doctor know what
21 things to think about? Not necessarily. And that's
22 true. You know, that's not a critique of anybody.
23 There's plenty of things that --- I'm doctor that I
24 don't know --- I know in my area other doctors know
25 things in their area. And the good thing that you can

1 do is to help them --- direct them to the things that
2 they should --- they should have information about.

3 And that can be done easily and cost-effectively ---

4 Q. Yes.

5 A. --- you know.

6 Q. And --- and --- and --- and the issue of PFOA
7 exposure in the water in Bennington has been the
8 subject of countless reports in the news media, whether
9 in newspapers or television reports.

10 Correct?

11 A. That's right.

12 Q. And is it ---?

13 A. Countless is wrong, but many.

14 Q. At some point somebody could count them up, but it
15 would be a lot.

16 Right?

17 A. It would be plenty.

18 Q. And is --- is it fair to say that members of the
19 medical community in Bennington area are conscious of
20 these issues?

21 A. I assume they're conscious of it. I assume they
22 know that this is an issue their community.

23 Q. And --- okay.

24 So we're done with page 27. Please turn with me
25 to page 32. And let me know when you're there.

1 A. I think we were here before.

2 Q. Maybe. The ATSDR/CDC states that more than 95
3 percent of the represented U.S. population has
4 measurable blood levels of PFOA and PFOS. The presence
5 of these PFAS in blood only confirms exposure. This
6 does not mean your patient will suffer any adverse
7 health effects. Routine blood tests for PFAS cannot be
8 extrapolated to any specific health effects and cannot
9 guide medical decision making.

10 Correct?

11 A. It says that.

12 Q. Do agree with that statement?

13 A. PFAS tests alone should guide medical decision
14 making. They're correct. A PFAS test alone cannot
15 guide medical decision making, with one possible
16 exception but it's one that would be up for debate. Do
17 you want to discuss that one?

18 Q. If you do.

19 A. You asked me the question, so it's up to you.

20 Q. Okay.

21 I'm just --- I was asking you if you agree with
22 that statement. And if you disagree with the
23 statement ---.

24 A. There's --- there's one detail in which this could
25 be wrong in some clinicians' eyes and I don't think

1 it's important. And I asked you if you want me to go
2 over ----.

3 Q. Okay. If it's ---- if it's not important then
4 let's not discuss it.

5 A. Okay.

6 Q. Is it fair to say that because biomonitoring
7 sampling results for PFOA cannot predict current or
8 future health outcomes or diseases the results are not
9 clinically actionable?

10 A. Okay.

11 So we're back to that same thing. Usually the
12 results themselves are not --- PFOA, PFOS, PFNA, PFHxS,
13 any one of them, they alone are not clinically
14 actionable, with that one exception. It's probably ---
15 just --- let's get it out there so that it's --- it's
16 --- you'll understand that it's not --- that I said I'm
17 trying to be accurate. And that is that some doctors,
18 and it's not a majority, think that we should be doing
19 things to get the ones out of people's bodies at a more
20 rapid rate where we have medicines that can do that.

21 And it's certainly a consideration. It's a
22 legitimate consideration. I think it's a research
23 question rather than a clinical question at this point.
24 So in my mind it's not a clinically actionable thing to
25 do. But I know some patients really want it done.

1 Q. Okay.

2 Let's turn back just for a moment to the average
3 blood levels of PFOA. Merely having a blood level of
4 2.1 micrograms per liter of PFOA is not necessarily a
5 risk.

6 Is it?

7 A. Yeah, it is. I'm sorry. It's --- it's a risk.

8 Q. Why do you say that?

9 A. It's a toxin, it has activity. And you don't want
10 that activity in your body. I don't want it in my
11 body. It is a risk. And not only that, it's a risk at
12 which you go above that level just --- you know, start
13 moving up the chain. And we know that we can see that
14 you have higher cholesterol and LDL cholesterol in
15 pretty large studies.

16 And we also know that when people decrease from
17 those levels on average --- pick your levels --- as
18 people come down, your LDL and total cholesterol come
19 down in at least one study.

20 So I actually think it is a risk. You don't want
21 it in your body. It's an inappropriate thing to have
22 there. It is a known toxin and it is a risk.

23 You may be asking the question in a different way,
24 in which case you should rephrase it.

25 Q. What do you have in mind?

1 A. Okay.

2 You may be asking me about if you have this do we
3 know the relative risk of testicular cancer. In which
4 case --- which you already asked. In which case the
5 answer is no.

6 Q. Bear with me just a moment. I just need to confer
7 with my colleague.

8 ATTORNEY WOLFF:

9 Why don't we just go off the record.

10 VIDEOGRAPHER:

11 Going off the record at 11:02 a.m.

12 OFF VIDEO

13 ---

14 (WHEREUPON, AN OFF RECORD DISCUSSION WAS HELD)

15 ---

16 ON VIDEO

17 VIDEOGRAPHER:

18 Back on the record 11:12 a.m.

19 BY ATTORNEY WOLFF:

20 Q. Dr. Ducatman, the reason why individuals who have
21 elevated cholesterol are prescribed statins is to
22 reduce the risk of adverse cardiovascular disease.

23 Correct?

24 A. Yes.

25 Q. Are the elevations in cholesterol that have been

1 seen in PFOA exposed populations clinically
2 significant?

3 A. Yes.

4 Q. Has there been a statistically significant
5 increase in adverse cardiovascular events among
6 populations exposed to PFOA?

7 A. No.

8 Q. How, if at all, do you describe --- do you ---
9 strike that.

10 How, if at all, do you explain that discrepancy?

11 A. First we don't know for sure why there is a
12 discrepancy. So that's the best explanation.

13 Q. Okay.

14 A. I'm not done.

15 Q. Okay. Please continue.

16 A. In addition, we know that if you have been exposed
17 to this --- this compound, that you are more likely to
18 have higher cholesterol. And in addition, you are more
19 likely to need to take a drug to lower your
20 cholesterol. We have that. We have that data in the
21 literature. So it is clinically significant to people.
22 Now, what we don't know is why that hasn't led also to
23 higher rates of detectable heart disease. I heard
24 three different hypotheses for that. I can even go
25 through them or we can skip over them. And we haven't

1 found that increased risk.

2 Q. But I prefer to save that discussion for another
3 day. Thank you.

4 Is it fair to say that medical monitoring in the
5 form of medical screening is a systematic search for
6 disease in people who have no signs or symptoms of that
7 disease?

8 A. I've seen that definition and it's clearly wrong.

9 Q. What's wrong with it?

10 A. Well, take hearing testing. We do medical
11 monitoring for hearing testing all of the time in
12 people who have signs and symptoms of the disease.
13 Monitoring for hearing loss.

14 Q. Okay.

15 So that person has then already a symptom or sign.
16 My question is a little bit different. When you do
17 medical monitoring in the form of medical screening in
18 people who have neither signs nor symptoms of that
19 disease, you are attempting to make a systematic search
20 for disease in that population.

21 Correct?

22 A. Leaving aside the word systematic and what it may
23 or may not mean, it's correct. We're looking for ---
24 we're looking for early --- the goal is early
25 detection.

1 Q. And when you commit asymptomatic plaintiff to
2 medical monitoring, you're making a medical decision
3 and are intervening in their lives medically.

4 True?

5 A. So there's couple of assumptions in here that I
6 just need to go over. First we are assuming that the
7 --- you said plaintiffs in this case. But let's talk
8 about the population.

9 Q. If I did, I misspoke.

10 A. I thought you said.

11 Q. I thought I said patients. But okay.

12 A. I heard plaintiff. I apologize.

13 Q. If I didn't, I misspoke. I meant asymptomatic
14 patients. Whatever I said.

15 A. So when we do medical monitoring for a population,
16 some of them are symptomatic and some of them aren't.
17 And we don't distinguish. And we don't say to the
18 people, if you already have symptoms, you're not going
19 to be in our program. I mean, that's just generally
20 not the case. We don't do that.

21 For the people who are asymptomatic, we don't
22 commit them. Okay. They understand what the program
23 is. We tell them what the program is and they commit
24 themselves because they see a benefit. I am not aware
25 of a program that I have conducted, with the exception

1 of flu testing, where a person couldn't opt out. Now,
2 also lead testing. People can't opt out of lead
3 testing in some cases. Children. The parents can opt
4 the children out. But there are some jobs where people
5 are required to be lead tested.

6 But in general people can opt out of testing, even
7 in work places for medical monitoring with certain
8 small exception. Drugs, I just mentioned. Lead in
9 some cases because they really need to be sure that
10 they got the environment right.

11 Q. In an asymptomatic population, is it fair to say
12 that the vast majority of the people being screened
13 will not have the disease being sought?

14 ATTORNEY WHITLOCK:

15 Objection. Calls for speculation.

16 A. There are many populations in which that's true.
17 And I've also put populations in medical monitoring for
18 which that wasn't true. Where we found the disease
19 actually in everybody we sought it. That was medical
20 monitoring done later than it should have been.

21 BY ATTORNEY WOLFF:

22 Q. Is it fair to say that medical screening in an
23 asymptomatic population is often up against staggering
24 odds?

25 A. Are you asking me a legal question about getting

1 it?

2 Q. No, I'm asking a medical question.

3 A. I don't understand the question.

4 Q. Okay.

5 Is it fair so say that screening an asymptomatic
6 population must involve many people to potentially
7 benefit a few?

8 A. Almost all preventive services are like that and
9 there are exceptions, which we've already discussed.
10 The benefit of the population level is very large. And
11 not all of the people in the population are direct
12 beneficiaries. Except in the sense that they share in
13 the, whatever benefits come to the population as a
14 whole. They may not get them personally, except
15 indirectly because their neighbors, or their family, or
16 their friends have the benefit. That's an indirect
17 benefit.

18 Q. In assessing the utility of medical monitoring in
19 an asymptomatic population, wouldn't one have to take
20 its risk and benefits into account?

21 A. Yes. One should take both risks and benefits into
22 account.

23 Q. Is it fair to say that in a population of 1,000
24 asymptomatic individuals being screened over a decade
25 in an older population, and even with a common cancer,

1 only a few, maybe 10 to 12, would be destined to die
2 from the cancer?

3 A. Well, that question is just --- that question is
4 just not answerable. It's --- it's not a good --- it's
5 not an okay question to answer.

6 Q. Okay.

7 Is it fair to say that in assessing a medical
8 monitoring program in an asymptomatic population, the
9 population being screened should be at a significantly
10 higher risk for the undiagnosed disease? That is the
11 disease should have a sufficiently high prevalence in
12 the population?

13 ATTORNEY WHITLOCK:

14 Object to the form.

15 A. You asked two questions there. Should I answer
16 them sequentially.

17 BY ATTORNEY WOLFF:

18 Q. Please?

19 A. Okay.

20 So we generally don't do this unless there is an
21 increased risk. So that's first. And that's correct.
22 And then you said that there has to be a high
23 prevalence of the disease in the population. And
24 that's not always the case. When we have the ability
25 to intervene early, sometimes we actually use the

1 screening to let, to show us how good a job we're doing
2 with the condition. You want examples of that or do
3 you want me to leave it at that?

4 Q. You can leave it at that. Thanks.

5 Is it fair to say that in assessing a medical
6 monitoring program in an asymptomatic population, one
7 should consider the natural history of the disease and
8 the evidence for an improved clinical outcome as a
9 result of the medical monitoring for the given disease?

10 A. Yes.

11 Q. The goal of detecting disease earlier through
12 screening is to improve the outcome when compared to
13 the outcome of the same disease that is identified,
14 because the patient experiences symptoms and goes to
15 the doctor.

16 Correct?

17 A. Yes. Or doesn't go to the doctor, even worse.
18 The point is early detection can lead to earlier and
19 better treatment.

20 Q. And early detection through screening should be
21 known to have an impact on the natural history of the
22 disease process.

23 Correct?

24 A. Yes. You should choose diseases in general where
25 you can have an impact. There are some debates about

1 that. But in general, most experts would say that's
2 the case.

3 Q. Okay.

4 And the period of time between when a cancer
5 starts growing and when it causes symptoms is when
6 screening can catch the cancer. True?

7 A. That's partly true. Sometimes you catch it in
8 symptomatic people who haven't mentioned it to anybody.
9 So you're partly right. And of course, that's --- the
10 goal is to catch it pre-symptomatically. But we also
11 catch it when they're symptomatic and they haven't
12 mentioned it to anybody because they're going through
13 the process.

14 Q. And aggressive, fast growing cancers are often
15 missed by screening, aren't they?

16 A. Yes. That can happen.

17 Q. And when?

18 A. Often is not the word that I would use. Leaving
19 out the often, it can happen.

20 Q. And what population based cancer screening tests,
21 if any, have ever been shown to reduce overall
22 mortality?

23 Q. Cancer screening in reduced mortality? Certainly
24 every once --- about every --- about every decade to
25 two decades some wit, who's usually an epidemiologist,

1 points out that no one has ever proved that screening
2 reduces cervical cancer. Okay. And, you know, you
3 just read articles like that and you say yeah, okay.
4 Maybe you want your family to not get screened. But
5 believe me, screening for cervical cancer not only
6 reduces disease, but it prevents death. And it does so
7 extremely reliably. We occasionally fail. But the
8 difference in cervical cancer death rates before we
9 started and today are due to screening. And so, you
10 know, you probably don't want me to keep going. But
11 that's an example.

12 Q. Okay. Cervical cancer. Got it.

13 As a physician. Do you use subscribe to the
14 proposition that health is not only a physical state of
15 being, but is also a state of mind?

16 A. Yes. Health is absolutely more than just what we
17 can measure in people.

18 Q. And do you agree that as a physician you have to
19 be careful not to undermine a person's state of health?

20 ATTORNEY WHITLOCK:

21 Object to the form.

22 A. I'm not sure what you mean exactly. But I'm going
23 to give you a sort of parallel answer. Which is we are
24 trained from the first day of med school above all do
25 no harm. So I think that's what you're getting at.

1 BY ATTORNEY WOLFF:

2 Q. It is. Okay. On page six of your report, if you
3 have that in front of you? All right. Let me know.
4 That looks like it could be it.

5 A. Page six.

6 Q. Page six. You state that a medical monitoring
7 program for the individuals in Bennington who have been
8 exposed to PFOA through contaminated water should
9 include monitoring for each of these health effects to
10 the degree that useful testing exists.

11 Correct?

12 A. Yes.

13 Q. What do you mean by the qualifier to the degree
14 that useful testing exists?

15 A. So there's a process you go through for medical
16 monitoring. These are --- these are things that have
17 been established in the literature as increased risks.
18 Then you take that universe of diseases and diagnoses
19 where there are increased risks of disease. And you
20 say which one of these do we have tests for which we
21 can detect the disease early. That's actually not the
22 last step. But it's the next step. And it's what that
23 sentence is about.

24 Q. Got it.

25 Would a component of whether a useful test exists

1 for medical monitoring be the principle that the
2 benefits of the test outweigh its risks?

3 A. I already mentioned the next step. After a useful
4 test exists. So after a useful test exists. So there
5 is a test. Now, we say to ourselves, okay. This test
6 exists. We're going to think about applying this test
7 in this population. So many people will have
8 positives. So many people will have negatives. We
9 will find some outcome for this test. Is the
10 population substantially better off because we did it?
11 Then as opposed to when you do a test, sometimes you
12 can get a wrong signal. A person can get healthcare.
13 And then the healthcare can --- the upshot of the
14 healthcare is yeah, it's good you came. But you don't
15 have a problem. And that has a cost. Okay. So I
16 thought about all of those things. And you have now
17 jumped to the third kind of thing that you do in what's
18 a multi-step process.

19 Q. Okay.

20 Would a component of your multi-step process be an
21 assessment of the specificity and the sensitivity of
22 the test?

23 A. We'll, yeah. I didn't formally address
24 specificity and sensitivity in some cases. What I
25 thought about instead, sensitivity was looked at. What

1 I should say is it wasn't the deciding factor in any
2 case. In my mind, specificity was more interesting
3 than sensitivity. If it had low sensitivity, but had
4 good specificity, it wasn't doing harm for example.
5 What you really want to think about is predictive value
6 within the population because you have to think about
7 increased risk. And the thought about increased risk
8 is why every guideline has --- by the way if there's an
9 increase risk, you may do it differently than this
10 guideline. And then some of them go on to say what you
11 will do if there's increased risk, depending on what
12 the nature of the increased risk is.

13 Q. Okay.

14 A. So sensitivity and specificity enter into it.
15 Predictive value would be a better concept. And that's
16 still not the final arbiter because whether or not
17 you're doing harm, which is the next next step down,
18 is, you know, is an important consideration. And that
19 doesn't fall seamlessly from just sensitivity,
20 specificity or even predictive value.

21 Q. Would a component of your multi-step assessment be
22 that the early detection improves the outcome or the
23 natural history of the disease?

24 A. Yes.

25 Q. Just in the context of a clinical test, what is

1 sensitivity?

2 A. It's the ability to find the problem in people who
3 don't have it. In people --- excuse me. In people who
4 have it. So your --- it's a --- it's a statement about
5 the test. And it's less a statement about how the test
6 applies to the person. As opposed to the predictive
7 value, which is more a statement about if this test is
8 positive, this is how likely it is in this population
9 to be a useful test.

10 Q. And in the context of a clinical test, what is
11 specificity?

12 A. So it's kind of --- the opposite may not be
13 technically correct. But it's kind of the opposite.
14 It's the ability to say if you don't have this and
15 we're not going to find it. Okay. So it's about not
16 finding the problem accurately.

17 Q. In assessing a medical monitoring program in an
18 asymptomatic population, should one consider the
19 sensitivity and specificity of the proposed medical
20 monitoring tests?

21 A. You do think about it. It just doesn't have to be
22 the final arbiter.

23 Q. Is it fair to say there may be serious
24 consequences in the use of screening tests with poor
25 sensitivity or poor specificity?

1 A. Well, okay, so I'm going to divide that into two
2 questions. If the test will detect some cancers ---
3 you used the example of cancer. Much of this isn't
4 about cancer. But you used the example of cancer. If
5 the test will detect some cancers and miss some. So
6 it's sensitivity isn't that good, that's usually not a
7 reason to not do it because you still have improved.
8 Okay. So sensitivity may not be an important arbiter
9 if you can improve things. Provided that the
10 participant understands that we don't even warranty,
11 you know, make a warranty to the product. In other
12 words, we can't promise that healthcare and medical
13 screening is always going to tell you that you're
14 healthy at this moment, even when we've done it. It
15 just doesn't do that. Just like the presence or
16 absence of PFOA. It doesn't tell you you're definitely
17 going to be sick. The presence or absence --- the
18 absence of a negative screening test doesn't say that
19 you can't be sick. Okay.

20 Q. Is there a second part?

21 A. Yeah, there's a second part. I'll come to that in
22 a second. I want to finish about sensitivity first.

23 Q. Okay.

24 A. Okay. The key there is that you improved things
25 and you're convinced that you can improve things. And

1 then you go on to the fourth step in the process.

2 Q. Okay.

3 A. Imagine yourself sitting down with a primary care
4 doctor in Bennington. And you say okay, here's the
5 program. Here's what we thought. Now, criticize me
6 for what's too much and what's too little. What do you
7 think should be added? And what do you think isn't
8 enough? And you listen carefully because they're the
9 doctors on the ground. Okay. They're the ones who are
10 --- ending up going to have to, you know, implement in
11 some cases, or see in their offices in many cases
12 whatever comes out of the medical screening. And you
13 want them to be comfortable with the process that's
14 going on in their community. You want them to think
15 about it. And they were taught in medical school, just
16 as the rest of us, about sensitivity, and specificity,
17 and predictive value. They may not live with it
18 everyday like some of us do. But they know about it.
19 And they'll have their opinions. And you listen
20 carefully. And that's a fourth step.

21 Q. And let me ---.

22 A. Now, onto your second part.

23 Q. I know that. I know that. I'm just going to ask
24 a quick interjecting question. And we'll get back to
25 it. Have you done that fourth step? Have you spoken

1 with ---

2 A. No.

3 Q. --- practitioners in Bennington?

4 A. No. All I've done with that is I put everything
5 in my mind. Here's the conversation in my mind.
6 Here's where I think, you know, reasonable doctors will
7 sit down and agree that were doing more good than harm.
8 And I think it would be really good to have that
9 conversation. And in fact, it's actually written in
10 that we should have that consultation into the
11 proposal.

12 Q. Got it. Now, let's go to the second part, which
13 is the specificity.

14 A. Okay. So the specificity is, you know, you get a
15 test and you --- I'd rather talk about predictive
16 value. But if you really want to stick with
17 specificity because specificity is not about the test.
18 Okay. I would --- would you be ---?

19 ATTORNEY WHITLOCK:

20 Just answer his --- just answer his
21 question.

22 A. Okay. So the specificity is you get a test.
23 Okay. You do the test. And you want to know how well
24 a negative test reflects a reality. And that's just
25 kind of an inverse way to think about it. The way

1 clinicians think about it, it's important
2 mathematically. But it's not that great in terms of
3 doing medical surveillance. It's less important to the
4 patients. They want to know about --- they want to
5 know about something completely different, which is
6 called predictive value.

7 BY ATTORNEY WOLFF:

8 Q. What is predictive value?

9 A. Predictive value is we have the test. The test is
10 negative. How likely are you to not have the disease?
11 You have the test. The test is positive. How likely
12 are you to have the disease? And that varies with the
13 amount of disease to be detected in the population. So
14 it's a --- we call that a Bayesian problem, which is
15 informed by the amount of disease that's there in the
16 population.

17 Q. What is a false positive?

18 A. A false positive is a positive test in a patient
19 who doesn't have the disease.

20 Q. Is a false positive a false alarm?

21 A. It's possible to use that word. I don't think
22 it's very informative because doctors don't do things
23 that alert and alarm their patients when they just get
24 a false positive. They say we need to follow-up on
25 this and get more information. They don't send out a

1 whole group of other doctors who are going to begin to
2 treat it on a specialty basis on the basis of one test.
3 I don't think the analogy is that good. You could use
4 it if you want. But as a doctor, I don't like it. I
5 don't think it's a good comparison.

6 Q. What is a false negative?

7 A. A false negative is when you get a negative test
8 when the disease is present.

9 Q. What is over diagnosis?

10 A. Over diagnosis is when we diagnose disease where
11 it doesn't exist. And the implication is we do it
12 routinely.

13 Q. Is it fair to say that in the context of cancer,
14 over diagnosis is the detection of a cancer that is not
15 destined to ever cause symptoms or death?

16 A. Okay. You're talking about a different concept.
17 And you're talking about --- it's this is a really
18 prominent literature. It's most prominent in prostate
19 cancer. And in prostate cancer, they use the word
20 overdiagnoses. So now, I know why you're using that
21 word. You used it a different way than I did.

22 Okay. Over diagnosis as you mean it is just what
23 you said. The early detection of the disease for
24 diseases that do not necessarily lead to disability or
25 death. And if you do that, the over diagnosis argument

1 is that since you detected that disease early, you
2 actually on average in a population, do patients more
3 harm than good. And that's the over diagnosis
4 argument. And it relates mostly to prostate cancer.
5 But there's also a type of thyroid cancer for which
6 it's also very clearly at issue. And if we sat here
7 and thought about it, I can probably come up with some
8 others too.

9 Q. Over diagnosis is also an issue with breast
10 cancer, is it not?

11 A. So with breast cancer, that kind of over diagnosis
12 is an issue. As it gets better and better, it's very
13 clear that early detection is really a great idea. So
14 over diagnosis is a discussion. But now we're using it
15 the way I used it initially. And not the way you used
16 it. Okay. There are no arguments out there that we
17 shouldn't try to find breast cancer as early as
18 possible. The only discussion is at what age do you
19 start.

20 Q. Is it fair to say that over diagnosis is the
21 identification of slow-growing cancers that even if
22 untreated, would never cause symptoms or reduce
23 survival, because the screening test cannot distinguish
24 between the abnormal appearing cells that would become
25 cancerous from those that would never do so?

1 A. For cancer, that's a good description. The other
2 issue is whether they're actually neoplastic to begin
3 --- if they're neoplastic --- they are neoplastic by
4 definition, whether they're actually cancer. Okay. So
5 that's another subset of that discussion.

6 Q. A false positive test effectively means that you
7 are sending a healthy patient to a doctor for some type
8 of follow-up.

9 Correct?

10 A. Well, you sometimes don't send them depending on
11 what you think the signal is and who you think the
12 patient is. But if you do send the patient, then
13 you're correct.

14 Q. And a false negative test effectively means that
15 you are clearing a patient who should be referred to a
16 doctor for some type of follow-up.

17 Correct?

18 A. In the context of what we're talking about. And
19 actually, it doesn't specifically mean what you said.
20 But in the context of what you're talking about in
21 medical monitoring, that is what it means.

22 Q. What are the harms related to a false positive
23 test result?

24 A. Well, the common harm is the patient has an
25 additional evaluation. The less common harm, but it's

1 not impossible, is that evaluation becomes invasive.
2 And the patient has harms of invasive diagnosis. And
3 then still less common, but can happen is the patient
4 actually gets an important intervention for a disease
5 they don't have. And implicit in all of this is cost.

6 Q. Have you ever heard of the concept of labeling?

7 A. You're talking about labeling patients?

8 A. Yes.

9 Q. So giving them a label that makes them feel
10 self-conscious is what you're getting at?

11 A. Yes.

12 Q. Is that a harm related to a false positive test?

13 A. Well, it can be in some patients. Most patients
14 are pretty resilient to that. You do have to be, you
15 know, this is actually me. I'm in the clinic. I'm
16 with a patient. You see, you size up the patient.
17 It's a fellow physician, you know. We have a very
18 frank conversation. It's somebody who I take to be
19 more fragile and so forth, I say look here's what we
20 found. Here's what we need to do. There's no reason
21 to worry now, you know. So you either --- you take
22 what you know about the patient when you find a
23 problem. But that doesn't mean that you back off from
24 finding the problem. Patients are there to see you
25 because they want you to do your job.

1 Q. What harms are related to a false negative test
2 result?

3 A. There are fewer harms, but they still exist. It's
4 the patient can think that they have been cleared for a
5 disease that they actually have. And that can be
6 harmful. You know, a well designed program won't in
7 general create that perception. However with an
8 individual patient, perceptions are hard to predict.

9 Q. What harms are related to over diagnosis?

10 A. Over diagnosis can lead to --- you used it both
11 ways. But I think you have now mean it in terms of a
12 disease where you're detecting both really important
13 and indolent cancers together. And you're talking now
14 about the indolent cancers that would not necessarily
15 affect the patient in their lifetime.

16 Q. Correct. That's what I'm talking about.

17 A. Thank you. In that circumstance the harm is, and
18 this actually happened in one nation very routinely and
19 in the U.S. to some degree, for example, for thyroid
20 cancer. The harm is that people get a surgery they
21 don't need. And then they need healthcare and
22 follow-up to that surgery because the surgery may, for
23 example, take out the thyroid.

24 Q. Can we go off for just a minute?

25 VIDEOGRAPHER:

1 Going off the record at is 11:44 a.m.

2 OFF VIDEO

3 ---

4 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

5 ---

6 ON VIDEO

7 VIDEOGRAPHER:

8 Back on the record is 11:51 a.m.

9 BY ATTORNEY WOLFF:

10 Q. Is it fair to say that false positive results can
11 result in follow-up testing that is uncomfortable,
12 expensive, and potentially harmful?

13 A. That can happen. All of that can happen.

14 Q. Is it fair to say that persons with false negative
15 results may have delays in diagnosis and treatment?

16 A. I don't know the answer to that. I don't think we
17 know that a false negative. Again, you're asking a
18 question in the context of medical surveillance. So
19 it's certainly true outside of the context of medical
20 surveillance. Because if you miss it and it's your
21 patient, then you do have a delay and it's a problem.
22 If medical surveillance also misses it, and you're
23 already at zero, you know. And have you added to the
24 problem? I don't know the answer to that. So the
25 former is certainly the case. The latter is kind of

1 philosophical question.

2 Q. Is it fair to say that although screening may
3 prevent the development of disease related morbidity
4 and mortality, positive test results, both false
5 positive and true positive, may lead to interventions
6 that could be unnecessary or even risky because of over
7 diagnosis and over treatment?

8 A. Without getting into the definitions, I think the
9 general answer is yes. All of that is possible.
10 Medicine is imperfect.

11 Q. Is it fair to say that the normal ranges for
12 biochemical tests are often based on the 95 percent
13 confidence intervals in a normal healthy population?
14 That is although everyone is healthy by convention, the
15 values outside the 2.5 percent lower, and 2.5 percent
16 upper extremes are considered to be abnormal?

17 A. They're reported by the lab as abnormal when they
18 have been derived that way. Not all tests are derived
19 that way. There are some for which abnormals are
20 actually not about the 95th percentile. For the ones
21 where it is the 95th percentile, the abnormals are
22 reported that way, and they're reported as abnormals.
23 As labs, they don't say that you have this disease.
24 They're reported as lab abnormals. Does that answer
25 your question?

1 Q. It does. Thank you.

2 Is it fair to say that ordering six blood tests in
3 a normal healthy individual yields only a 74 percent
4 chance that all six tests will be normal? That is
5 there's a 26 percent chance that one or more may be
6 abnormal?

7 A. Well, I have to sit down and do the regression.
8 My guess is that you're approximately right because
9 without doing the regression, that sounds in the
10 ballpark.

11 Q. And when ordering 12 tests in a normal person,
12 there is a 54 percent chance that all 12 will be
13 normal. And a 46 percent chance that one or more will
14 be abnormal.

15 Correct?

16 A. Your general point is correct. As to the
17 percents, you know, I'm not running the math through my
18 head right now.

19 Q. Fair point.

20 A. Probably nobody in this room could.

21 Q. Is it fair to say that simply ordering tests in
22 healthy individuals or in the absence of clinical
23 suspicion of disease may result in many false positive
24 test results that can lead to false alarms, anxiety,
25 additional testing, and possible morbidity, or

1 mortality from subsequent testing or interventions?

2 ATTORNEY WHITLOCK:

3 Object to the form.

4 A. The word many sound editorial. Take out the many
5 and all of that is potentially true.

6 BY ATTORNEY WOLFF:

7 Q. You are no doubt familiar with the U.S.
8 Preventative Services Task Force.

9 Correct?

10 A. I am familiar with it.

11 Q. The U.S. Preventive Services Task Force was
12 established by a congressional mandate. And is
13 comprised of an independent volunteer panel of 16
14 national experts in prevention and evidence-based
15 medicine.

16 True?

17 A. I didn't know the number. If you say it's 16,
18 then I accept it.

19 Q. And one of your former colleagues on the faculty
20 at West Virginia University School of Public Health,
21 Dr. Gilbert Ramirez recently served as a member of the
22 Task Force.

23 A. I didn't know that.

24 Q. You didn't know that? Okay.

25 Is it fair to say that the task force is generally

1 considered to be a reputable and reliable part of the
2 medical community?

3 A. Yes.

4 Q. Have you ever applied to be a member of the task
5 force?

6 A. No. And did you say medical community?

7 Q. Yes.

8 A. Okay. So just a couple of points of
9 clarification. One is that I think it's preventive and
10 not preventative.

11 Q. Yes, preventive. Yes.

12 A. And the other is --- the other is that I don't
13 think Dr. Ramirez is a physician.

14 Q. Dr. Ducatman, Exhibit 11 is an excerpt from the
15 U.S. Preventive Services Task Force procedure manual.
16 And if you would please turn with me to page 43, which
17 is the last page in this excerpt. And the second
18 paragraph, which is section 6.6.2 under the heading of
19 general types of harm for consideration. Do you see
20 that?

21 ---

22 (Whereupon, Exhibit 11, Excerpt from U.S.
23 Preventive Services Task Force Procedure
24 Manual, was marked for identification.)

25 ---

1 A. I do.

2 BY ATTORNEY WOLFF:

3 Q. Do agree with the proposition that harms of
4 screening may include psychological harm from labeling,
5 the harms of diagnostic studies to confirm the presence
6 of the conditions, and over diagnosis of screen
7 detected conditions?

8 A. That's the second paragraph, yes.

9 Q. Was your answer yes?

10 A. Yes.

11 Q. Do you agree with the proposition that because
12 screening and other preventive interventions are
13 implemented in asymptomatic persons with the goal of
14 preventing future disease, one should place a high
15 priority on considering the harms of over diagnosis and
16 over treatment. Whereby the preventive service has the
17 unintended consequence of creating disease that often
18 leads to unnecessary and ineffective treatment?

19 A. I agree there's a caveat. And that is that we're
20 talking here about when the screening is done and those
21 are asymptomatic. And screening is done in both
22 asymptomatic and symptomatic people.

23 Q. Do agree with the ---?

24 A. Excuse me. Monitoring. I apologize. Monitoring
25 is done in both asymptomatic and symptomatic people.

1 Q. And this concept applies to an asymptomatic
2 individual?

3 A. You know, it could also apply to a symptomatic
4 individual as well. Just maybe less likely to. But
5 this is only about the asymptomatic. And that
6 specifies it.

7 Q. Do agree with the proposition that harms of early
8 treatment and over diagnosis may include a patient
9 whose condition might never have come to clinical
10 attention, or for whom the harms of treatment initiated
11 prior to routine clinical detection were different, or
12 occurred earlier, or over a longer period of time? In
13 other words, these are harms of treatment that would
14 not have occurred in the absence of screening. Do you
15 agree with that proposition?

16 A. Yes. The last one is kind of ambiguous because
17 they're saying it's necessarily --- it can be read.
18 They may not be saying it. But it can be read to say
19 no longer treatment is necessarily bad. And of course,
20 when treatment is helping, you want it over a longer
21 period of time. It means you're living. But yes, I
22 agree with all of those things provided we understand
23 what it says.

24 Q. Please turn with me to page 42. Section 6.6.1 on
25 the preceding page. Are you there?

1 A. Yes.

2 Q. And do agree with the conceptual notion that
3 screening is intended for asymptomatic individuals in
4 order to prevent or delay future health problems?

5 A. I'm going to answer that question in two different
6 ways. First, the answer is yes. And secondly, that's
7 not all they're intended to do.

8 Q. Do agree with the proposition that the burden of
9 proof that the benefits exceed the harms prior to
10 recommending implementation of screening for other
11 preventive services is thus higher than it is for
12 diagnosis or treatment of symptomatic conditions?

13 A. That's their current stance. There are people who
14 disagree with it. And I'm kind of neutral about that.
15 I go to meetings about this. And people argue about
16 whether we have --- so I go to quality assurance ---
17 quality improvement meetings. It's one of my clinical
18 tasks. And people argue about whether the pendulum has
19 swung much too far so that we've placed a much too high
20 of a value on over diagnosis. And as a result, we are
21 missing diagnoses and hurting people that way.

22 Now, this sentence doesn't necessarily, you know,
23 tell you where you need to fit in that --- in that
24 continuum of yes, we should do it. No, we shouldn't do
25 it because we're thinking about the competing harms and

1 benefits. However, it only addresses one side of it.
2 And people worry about that. And they worry about that
3 a lot at meetings. And they're very critical of the
4 U.S. --- this Task Force.

5 Q. USPSTF.

6 A. Thank you. I appreciate that. I'm impressed that
7 you can do that because I mess it up every time I try.
8 They're critical of the USP --- this task force because
9 of that focus on just one side of it. And I hear that
10 continuously at meetings. I'm kind of neutral about
11 it. Both things are important. And I don't know that
12 they're a competition, except insofar as we're just
13 trying to do the best we can.

14 Q. Okay. We're done with this document for the time
15 being.

16 A. Thank you.

17 Q. Is one of the fundamental precepts of preventive
18 testing that one should avoid doing more harm than
19 benefit?

20 A. Yes.

21 Q. Doesn't screening all comers in an asymptomatic
22 population mean that you increase the number of false
23 positives, each of which comes with an obligation to
24 follow-up?

25 A. Not all positives come with an obligation to

1 follow-up. That's a decision. However, that danger,
2 then yeah. That danger is there. And again, you have
3 discussed only an asymptomatic population. And we
4 screen asymptomatic and symptomatic populations.

5 ATTORNEY WOLFF:

6 Exhibit 12 is an excerpt from the U.S.
7 PSTF Guide to Clinical Preventive Services.

8 ---

9 (Whereupon, Exhibit 12, Excerpt, was marked
10 for identification.)

11 ---

12 BY ATTORNEY WOLFF:

13 Q. And if you would please turn with me to the
14 preface on page Roman VI immediately under the bullet
15 points.

16 Do agree with the proposition that clinical
17 decisions about patients involved more complex
18 considerations than the evidence alone, clinicians
19 should always understand the evidence, but
20 individualize decision making to the specific patient
21 and situation. Do agree with that?

22 A. Yes.

23 Q. Do agree with the proposition that recommendations
24 for preventive services should be tailored to
25 individual patients?

1 A. I don't know what you mean. And the reason that I
2 don't know what you mean is in general, where we make
3 up --- where we do preventive services, we're generally
4 doing it for populations. We try very hard to think
5 about individuals within those populations. But the
6 services are generally tailored to a population.

7 Q. Do you agree with the proposition that preventive
8 testing should be tailored to meet a specific risk?

9 A. We like to tailor it to risks. I'm not sure I
10 know what you mean by specific. But I think it's okay
11 if you want to say specific. And then if you mean
12 something different than what I think you mean, we'll
13 talk about it later.

14 Q. Would you agree that if a false positive test
15 result leads to further testing, each of the follow-up
16 tests carries risks of false positive and false
17 negative test results?

18 A. All tests regardless of their origin carry those
19 risks. So you don't even have to stipulate with an
20 introductory phrase. Any test can have a false
21 positive. Any test can have a false negative.

22 Q. Because cancer screening is typically a repetitive
23 process at regular intervals, such as an annual
24 screening, false positive test results will accumulate
25 over time.

1 Correct?

2 A. I'm not sure I know what you mean by accumulate.
3 But there will be more. The longer you do it, the more
4 you'll have. I mean, we don't keep them in a box
5 somewhere. And, you know, the weight of the box gets
6 bigger. But there will be more of them. I think
7 that's what you mean.

8 Q. Are you familiar with the rate of false positive
9 results in screening mammography?

10 A. The rate keeps changing depending on the
11 technique. And I don't think there's a single rate.
12 There are false positives. And the balance against
13 that is the remarkable improvement in breast cancer
14 survival that has occurred over the past 20 years. So
15 yes, there's false positive. And yes, so far the
16 battle is worth engaging. And it looks like the longer
17 we do it, the better we get at it.

18 Q. Are you familiar with the data demonstrating the
19 long term psycho-social consequences of false positive
20 screening mammography?

21 A. Data and false positive? I haven't read that
22 specific literature. I've read about false positive
23 and emotional issues. And whether I read it
24 specifically about breast cancer or other diseases is
25 not something I remember. And I do not recall breast

1 cancer specifically.

2 Q. Is it fair to say that the harms of cancer
3 screening are more certain than the benefits?

4 A. I don't think there's many people who would agree
5 with that at all.

6 Q. In cancer screening in an asymptomatic population
7 as compared with avoiding a cancer death, false alarms
8 or false positives are much more common.

9 True?

10 A. Could you repeat that question? I just couldn't
11 follow it.

12 Q. Sure. In cancer screening in an asymptomatic
13 population, as compared with avoiding a cancer death,
14 false alarms or false positives are much more common.

15 True?

16 A. Cancer screening has false positives. I can't say
17 it's always the case if there's more than the true
18 positives. It may be cancer specific. In general, I
19 think there's a risk. That statement is generally true
20 for many cancers.

21 Q. Earlier today, we briefly discussed that over
22 diagnosis is a concept most widely understood in
23 prostate cancer screening.

24 Correct?

25 A. Prostate or thyroid. I would say those two. And

1 I think the general population is more aware of it in
2 prostate than it is in thyroid. But I'm pretty sure
3 doctors are aware of it in both.

4 Q. And over diagnosis is also recognized as a problem
5 associated with early detection of other cancers, such
6 as melanoma, kidney cancer, breast cancer, and lung
7 cancer.

8 Correct?

9 A. Well, it is. But for some of them, the real
10 problem is under diagnosis. And nobody's terribly, you
11 know. There are people who are focused on over
12 diagnosis because it's a problem and an issue. But the
13 real problem is we don't --- we're not really good at
14 finding it for some of them.

15 Q. All cancers have some harm, don't they? I'm
16 sorry. Strike that.

17 All cancer treatments have some harm, don't they?

18 A. I can't think of exceptions. There may be some,
19 but they don't come to mind.

20 Q. And unnecessary cancer diagnosis is an obvious
21 harm, isn't it?

22 ATTORNEY WHITLOCK:

23 Object to the form.

24 A. Any misdiagnosis is a harm. When you say
25 unnecessary, I don't know if you mean misdiagnosis.

1 BY ATTORNEY WOLFF:

2 Q. Over diagnosed cancers are typically treated
3 because doctors often cannot tell which ones they are
4 in an individual case.

5 True?

6 A. That can happen. They often are. They aren't
7 always. And that's why I didn't like your last ---
8 this is much better phrasing.

9 Q. The treatment of an over diagnosed cancer is
10 treatment that cannot help that patient because there
11 is nothing to fix in that patient.

12 True?

13 A. So there's two issues there.

14 Q. Okay.

15 A. Let's go over them. The first is if you can know
16 --- and you already alluded to this. The first is
17 knowing in advance. We know in advance that this one
18 is not going to grow. Well, darn it. We're not going
19 to treat. Or we know in advance that okay, this one
20 may grow a little. But this patient is 80. And we
21 know that its growth rate is such that this patient is
22 much more likely to get sick from something else first,
23 that's much more important. We're not going to treat
24 it. The key is knowing. The key isn't that that's an
25 issue. The key is knowing. And it's hard. And that's

1 what you're getting at.

2 Q. Would you agree that the treatment of an
3 overdiagnosed cancer is a treatment that can only lead
4 to harm?

5 A. If we accept that it's over diagnosed. If we
6 accept that we know it. So I mean, since you defined
7 it that way, yes. The problem is knowing which ones to
8 define that way.

9 Q. You do not use the terms sensitivity, specificity,
10 false positive, false negative, over diagnosis, or
11 prevalence in the text of your report, do you?

12 A. I don't recall using any of them.

13 Q. Why not?

14 A. I didn't think that it helped with anything
15 regarding the outcome that I came to at the end of the
16 report. At the end of the second report.

17 ATTORNEY WOLFF:

18 Let's go off the record.

19 VIDEOGRAPHER:

20 Going off the record 12:13 p.m.

21 OFF VIDEO

22 ---

23 (WHEREUPON, A SHORT BREAK WAS TAKEN)

24 ---

25 ON VIDEO

1 VIDEOGRAPHER:

2 Back on the record 12:52 p.m.

3 BY ATTORNEY WOLFF:

4 Q. On page nine of your report, at the end of the
5 second paragraph, you state that the earlier these
6 health conditions are detected, the more effectively
7 they can be treated. My question is this. Is that
8 statement true for each and every of the end points
9 that you list on pages five and six of your report?

10 A. I have to think about that. I can't assert that
11 it's true for each and every one of them.

12 Q. Can medical monitoring through the clinical
13 laboratory tests that you list on pages seven and eight
14 of your report improve the shorter duration of breast
15 feeding?

16 A. That's possible, but we don't know that. It can.

17 Q. Can medical monitoring through the clinical
18 laboratory tests you list on pages seven and eight of
19 your report, improve the outcome of developmental
20 abnormalities, including lower birth weights and more
21 markedly effective subsequent adiposity when compared
22 to the outcome of such developmental abnormalities that
23 are identified because the patient experienced symptoms
24 and goes to the doctor?

25 A. You know, it could. But that might not mean that

1 it's a great idea. Okay. And if you want me to
2 discuss that further, I can. That's up to you.

3 Q. So when you say that it could, but that it might
4 not be a great idea, what in general do you mean?

5 A. With time. As time passes, the amount of
6 contamination within people is going to decrease. So
7 that's a good thing. On the other hand, there is a
8 window of health for giving birth and also for other
9 things related to human development that, you know, you
10 don't want to be too young. You don't want to be too
11 old. And so I mean, it's not that you can't be. It's
12 that ideally, and if you had your choice, you would
13 have --- you know, if everything else were equal you
14 would have a child at an age of maximum health. And
15 delay might or might not and most often would not play
16 into that. And so the answer is it could help. But it
17 might not help. And you have to think about it both
18 ways very carefully.

19 Q. How could the clinical laboratory tests that you
20 list on pages seven and eight of your report improve
21 the shorter duration of breast feeding?

22 A. I think I just answered that. Do you want me to
23 expand on that? I should expand. It's clear I didn't
24 --- I didn't get it all the way through. So if you
25 --- the shorter duration of breastfeeding, if it's

1 causally linked, okay. And there's increasing evidence
2 that it looks like it may well be. And there's also
3 animal evidence that the breast is altered. And then
4 there's also a discussion about whether it's causally
5 linked through psychological means. But whether it's
6 psychological, or physical, or both, there is this
7 link. And if women choose to delay, and their
8 perfluoroalkyl substances go down, they may have, if
9 they improve and we don't know that they will. They
10 might have better duration of breastfeeding, longer
11 duration of breastfeeding. However, we don't know
12 that. And balanced against --- you asked if it could.

13 Q. Right.

14 A. If it could.

15 Q. And I guess the part I'm struggling with is you
16 have a list of clinical laboratory tests running from
17 albumin, right down through I think uric acid. And so
18 what I'm just trying to figure out is how do any of
19 those particular tests improve the ---?

20 A. I'm attempting to answer.

21 Q. Yeah.

22 A. So so now it's a mom. And she says to herself I
23 want to delay my pregnancy because. Now, I'm not
24 saying that's a good idea.

25 Q. Because of what?

1 A. Because of perfluoroalkyl substances would be
2 lower later.

3 Q. What does that have to --- got to do with the
4 level of albumin or BUN?

5 A. You didn't ask me albumin or BUN. You asked me
6 about breastfeeding.

7 Q. Right. My question was how can these tests ---?

8 A. If you want me to go through them one at a time, I
9 can. But you asked me about breastfeeding. I was
10 answering your question about breastfeeding, not about
11 albumin.

12 Q. So I think we may be having a disconnect. So my
13 question is, and you've got, you know, a series of
14 blood tests that you recommend. How do those series of
15 blood tests improve the shorter duration of
16 breastfeeding, if at all?

17 A. Well, you're confusing me because the end of the
18 second report, of course, we don't --- we don't do
19 anything other than ask questions about that.

20 However ---.

21 Q. Okay.

22 A. However, I will reiterate so that it's clear. I'm
23 not asserting it's a good idea. But it is the case
24 that it is possible that woman may delay. I get calls
25 all of time about things like this in my office. They

1 may delay their pregnancy and that might improve the
2 duration of their breastfeeding. I will tell you also,
3 I don't recommend that course of action. And that's
4 because if something that you also mentioned, which is
5 competing risks. Okay. So I don't recommend that
6 people delay pregnancy because of concentrations that
7 are in people's blood, or because of their fear that
8 they may have it, but they haven't been granted
9 testing.

10 Q. But what that really kind of keys off of is that
11 there is a sort of half-life of PFOA in the blood. And
12 that the blood levels decrease with time, as opposed to
13 being a function of the results of testing for albumin,
14 or BUN, or creatinine, or any of the others?

15 A. And you're testing for PFOA in that case. In each
16 one, you asked a question that was pertinent to the
17 testing of PFOA. And not a question that was pertinent
18 to the testing of anything else. If you want to ask a
19 question about anything else, I'll do my best to
20 answer.

21 Q. Oh, I see. So your question is in terms of what
22 the serum levels of PFOA are detected in the blood?

23 A. Well, your question was about breastfeeding. And
24 so the answer to have becomes about the PFOA serum
25 concentration.

1 Q. Okay. All right. That's where the disconnect
2 was. I now understand. Thank you.

3 Can medical monitoring through the clinical
4 laboratory tests you list on pages seven and eight of
5 your report improve the outcome of kidney cancer when
6 compared to the outcome of kidney cancer that is
7 identified because the patient experiences symptoms and
8 goes to the doctor?

9 A. Kidney cancer is a really tough disease. Anything
10 we can do that will speed up the diagnoses gives a
11 patient a much better fighting chance. In addition,
12 we're really bad at finding it. Really, really bad.
13 If you can detect it through a means that isn't
14 imaging, then you have a --- then you have a good, low
15 risk approach to thinking about whether or not you want
16 to look at it. And plus the urinalysis also addresses
17 another of the diseases that we're concerned with,
18 which has to do hyperuricemia.

19 Q. Do any of the --- are any of the blood tests that
20 you list on pages seven and eight of your report
21 diagnostic of kidney cancer?

22 A. None of them. There is no diagnostic test for
23 kidney cancer. There's nothing that lights up and says
24 you have kidney cancer. And frankly, for most cancers,
25 there's nothing that's absolute even for a really bad

1 looking mammography on breast cancer. That's very,
2 very high risk. It isn't always breast cancer. But
3 when you get hematuria and you start to think about
4 whether or not there's additional need for evaluation,
5 that's a reasonable thing to do. And it's something
6 that it would be a very reasonable discussion of the
7 doctors in Bennington.

8 Q. Can medical monitoring through the clinical
9 laboratory tests that you list on pages seven and eight
10 of your report improve the outcome of testicular
11 cancer, when compared to the outcome of testicular
12 cancer that is identified because the patient
13 experiences symptoms and goes to the doctor?

14 A. It can improve the outcome in this sense. You may
15 have to do less to treat it. The outcome of testicular
16 for a patient who goes to a, you know, a really good
17 hospital is so good already. We do so well these days
18 with testicular cancer that if the outcome is only
19 mortality, then I don't know that we improve the
20 outcome. On the other hand, if the outcome is how much
21 we have to treat to get to that outcome, then we can.

22 Q. Can medical monitoring through the clinical
23 laboratory tests you list on pages seven and eight of
24 your report improve the outcome of gout, when compared
25 to the outcome of gout that is identified because the

1 patient experiences symptoms and goes to the doctor?

2 A. Yes. The problem with gout is not only what
3 people think of as gout alone. It's the effects of
4 gout on the kidney. Earlier detection allows doctors
5 to think about whether or not they need to be
6 protecting the kidney.

7 There's also the prevention aspects of gout. You
8 don't want --- gouty attacks. That's --- that's also
9 there. But the kidney is the one where we actually
10 related to morbidity and mortality in a more direct
11 way.

12 Q. Let's --- I'll freely confess this may be a little
13 bit tedious. But I think it's just an exercise we need
14 to go through. And that is addressing sort of in
15 order, the tests that you list on pages seven and eight
16 of your report. Okay?

17 A. Okay.

18 Q. May I mention one thing about that? Some of
19 things that you talked about, you know, what we're
20 doing isn't per se a test. Okay. For example, for ---
21 for pregnancy induced hypertension, for example, where
22 we have an outcome, we're talking about your blood
23 pressure monitoring. It's not a lab test. Some cases
24 what we're doing is recording something on a survey and
25 not ordering a lab test.

1 Q. Is it fair to say that taking a blood sample with
2 a needle carries risks that include bleeding,
3 infection, bruising, dizziness, and soreness?

4 A. Yes.

5 Q. Albumin, if this test is positive, or in other
6 words abnormal, what specific disease, if any, is this
7 test for?

8 A. The reason I listed albumin there was first
9 because it's associated. And secondly because of its
10 association, which is actually non-causal. It makes it
11 easier to think about the perfluoroalkyl substance
12 levels. It's actually in the adjustment category that
13 people are concerned. It helps you think about if
14 there's some other reason. Some other contributing
15 reasons.

16 Q. So is there are any specific disease that the
17 albumin test is for?

18 A. There are. There are, but not in this. And we
19 didn't make it as a final recommendation. I didn't
20 think there was of benefit.

21 Q. So albumin dropped out in your merits report?

22 A. That's correct.

23 Q. Okay.

24 Alkaline phosphatase, if this test is positive,
25 what specific disease, if any, is this test for?

1 A. It's not specific. But you find it elevated in
2 several diseases, including biliary tract disease. And
3 we've --- I don't recall, but I don't think we included
4 it in the final list.

5 Q. Do you want to check that?

6 A. We can check it. It's not included.

7 Q. Why did you not include it in the merits report,
8 but did include it in the class certification report?

9 A. When I got to that last step, I was talking with
10 the doctors and Bennington in my mind. It wasn't that
11 it would do harm. It's that they would have patients
12 in their office with a question that wasn't directly
13 related to the major issues of concern. It was more
14 peripheral. And I thought they want to focus on the
15 major things. It wasn't a question of harm. It was
16 more a question of not enough benefits.

17 Q. Alanine aminotransferase, if this test is
18 positive, what specific disease, if any, is this test
19 for?

20 A. It's primarily for liver disease. There are other
21 things that can affect it a little bit. But it's a ---
22 it's called a liver enzyme.

23 Q. Is there any particular liver disease that it's
24 diagnostic of?

25 A. No, it's non specific. People use ratios between

1 it and other diseases in other, excuse me, it and other
2 bio-markers, in order to think about which diseases are
3 likely the ones present.

4 Q. What is the sensitivity and specificity of the
5 alanine aminotransferase test for diagnosing liver
6 disease?

7 A. The literature says it's actually pretty good and
8 specific. It's not perfect. It's not as sensitive as
9 you would like. And all that literature, and we
10 discussed that a little bit this morning, is based on
11 just as you framed it, 95 percent of the population
12 rather than the actual liver physiology. As we have
13 gone into the epidemic that we're having now of fatty
14 liver disease, or steatosis, or the spectrum of
15 non-alcoholic fatty liver disease. People have
16 rethought that approach. And they're now starting to
17 use a much lower cut off to figure out who needs to get
18 follow-up testing for fatty liver disease. And it's
19 very beneficial to know that at an earlier time.

20 Q. So they're using a lower cut-off on the alanine
21 aminotransferase?

22 A. ALT.

23 Q. ALT.

24 What is the predictive value of the ALT test for
25 diagnosing liver disease?

1 A. So that --- I know that sounds to you like a great
2 question, but it's not the test alone. What they're
3 doing is they're using a test in combination with other
4 things and they're using markers. However, there is
5 this very interesting paper that just came out. That
6 people with an ALT above, I want to say 23. And if
7 it's 25 or 26, I apologize, are that something like
8 when they went and evaluated these people, something
9 like 68 percent of them had the beginnings of fatty
10 liver disease. Which is actually pretty impressive as
11 a screening test if that stands up under a bigger
12 population.

13 Q. Is it fair to say that blood testing for ALT
14 levels is among the care that would be provided to
15 someone who sees a doctor regularly?

16 A. No.

17 Q. ALT levels are routinely checked as part of the
18 periodic physical exam.

19 Isn't that correct?

20 A. Well, it's no actually not. If you order an ALT
21 and you have an insurer involved, you kind of need to
22 say why you have done it. You have to have a reason.

23 Q. Would you find it unusual if several of the
24 Plaintiffs in this matter have had their ALT levels
25 routinely checked as part of a periodic physical exam?

1 A. No. There's some doctors who do that. But it's
2 not a current recommendation of anybody that I know
3 about. Now, you could see that change because of the
4 fatty liver disease question. And I would be an
5 advocate for that change based on literature I've seen
6 so far, if it pans out.

7 Q. Were you aware of the fact that several of the
8 Plaintiffs in this matter have had their ALT levels
9 routinely checked as part of the periodic physical
10 exam?

11 A. No. I think I already answered no, I am not
12 aware.

13 Q. Bilirubin direct in total. If this test is
14 positive, what specific disease, if any, is this test
15 for?

16 A. These are actually --- this is sort of like the
17 last question. These two things are different. And
18 epidemiologists always want to consider them together.
19 And then clinicians say no, they're no good together.
20 One of them has a different indication than the other.
21 So the direct bilirubin relates to the --- direct and
22 indirect versus conjugated and unconjugated. Come on,
23 Alan. Memory.

24 Now, I apologize. I'm having another memory lapse
25 right now of something that I've known for many, many

1 years. But one of them is about the liver. And the
2 other one is about the blood. And I'm pretty sure that
3 direct and conjugated are about the liver. But I know
4 I'm not even pretty sure. That's my memory at this
5 moment. But boy, I'm feeling a lot of uncertainty.

6 Q. So what --- just liver disease ---?

7 A. And blood disease. You want to know the
8 difference?

9 Q. No. No. Liver disease sort of categorically, and
10 blood disease categorically? Or any particular type of
11 liver diseases or blood diseases?

12 A. Well, bilirubin will go up eventually in all liver
13 diseases eventually. There's some that goes up even
14 more. But when you look at a bilirubin, you need to
15 know both because a total bilirubin can confuse you
16 because you don't know which it is.

17 Q. So what is the sensitivity and specificity of the
18 bilirubin test for diagnosing liver disease?

19 A. There is a --- it is not very sensitive. It
20 doesn't move much until much later. It is specific.
21 But there's one really notable exception. I'm looking
22 for the word exception. And that exception is a pretty
23 common condition, which is called Gilbert syndrome.
24 Which is generally not dangerous. But which captures
25 clinicians' attention, they're going to have to think

1 about it. Because the bilirubin is elevated in that.
2 And those patients are pretty often healthy. And
3 there's some literature. And in some ways they're
4 healthier. However, there also extreme cases of
5 Gilbert Syndrome which Gilbert itself to create a
6 problem. So it's like everything else. It's a
7 continuum. G-I-L-B-E-R-T. And is there an apostrophe
8 before the S? That convention has changed. There used
9 to be. But I'm not sure there still is. And it may
10 not be Gilbert.

11 Q. So what is the predictive value of the bilirubin
12 test for liver disease?

13 A. The predictive value. So if you get an elevated
14 bilirubin and it's the right one, there's something
15 wrong with that patient's biliary tree or liver. And
16 it doesn't have Gilbert Syndrome or some other similar,
17 very rare genetic abnormality. Gilbert is the common
18 one.

19 Q. And if the bilirubin test is positive, what is the
20 sensitivity and specificity for diagnosing blood
21 disease?

22 A. Okay. So we've now flipped over to blood disease.
23 You're looking at specificity and sensitivity in a
24 population. Well, if it's elevated enough, you can say
25 that they've got some hematologic problem pretty

1 quickly. But which one may require working with
2 additional, almost certainly will require additional
3 evaluation. Not real common, but we do find it.

4 Q. And what is the predictive value of the bilirubin
5 test for diagnosing blood disease?

6 A. Disease isn't always the right word. Sometimes
7 it's syndrome in people who aren't necessarily all that
8 sick. But disease is more common. And you get numbers
9 who prefer to say hematologic problems, so that we
10 understand it's not cancer, with elevated bilirubins.
11 It's pretty good for that when it gets high enough.

12 Q. Is it fair to say that blood testing for bilirubin
13 levels is among the care that would be provided to
14 someone who sees a doctor regularly?

15 A. No.

16 Q. Bilirubin levels are routinely checked as part of
17 a periodic physical exam, aren't they?

18 A. Not that I'm aware of. I don't think that that's
19 usually the case. There may be doctors who do it
20 because there's lots to be gained from it, but if you
21 look at those recommendations --- for example, you
22 know, whole population recommendations I don't think
23 you're going to see a bilirubin.

24 Q. Would you find it unusual if several of the
25 Plaintiffs in this matter have had their bilirubin

1 levels routinely checked as part of a periodic physical
2 exam?

3 A. No.

4 Q. Were you aware of the fact that several of the
5 Plaintiffs in this matter have, in fact, had their
6 bilirubin levels routinely checked as part of the
7 periodic physical exam?

8 A. No.

9 Q. Blood urea nitrogen or BUN, if this test is
10 positive what specific disease, if any, is this test
11 for?

12 A. In combination with creatinine. That helps you to
13 look at liver functions.

14 Q. Should we talk about both BUN and creatinine
15 together then?

16 A. We should.

17 Q. Okay.

18 A. However, you're probably aware that only one of
19 them is in the final recommendation.

20 Q. Which one is not in the final recommendation?

21 A. BUN.

22 Q. Why is BUN not in the final recommendation?

23 A. I didn't think the determination --- again,
24 imagine myself sitting with Vermont doctors and they
25 said, you know, if you send us --- if you send a

1 patient with elevated creatinine to the office we're
2 going to do a BUN. Take an extra step to figure it
3 out. Wouldn't be --- wouldn't be necessarily be needed
4 up front.

5 Q. If the test for creatinine is positive what
6 specific disease, if any, is this test for?

7 A. Positive is the interesting word, but skipping
8 past that it's --- it's for kidney disease.

9 Q. What is the sensitivity and specificity of this
10 test for diagnosing kidney disease?

11 A. As the creatinine goes up it's pretty good for
12 diagnosing kidney disease. Is it sensitive enough? It
13 is in one sense when we see abnormality it's --- it's
14 --- it's sensitive. The problem is it doesn't move as
15 fast as you would like and so you have to really be
16 thinking about it. May I give you --- should I give
17 you an example of what I mean by that? It's up to you.

18 Q. Yes.

19 A. Okay. So we're monitoring maybe a group of
20 workers who have cadmium exposure, it's not in this
21 community exposure, it's a group of workers. And
22 cadmium exposure is notorious for causing kidney
23 disease and we're checking creatinine and the
24 creatinine may or may not move. But if they do move
25 the problem is kidney disease has already happened.

1 We're not happy then. We would love a test that was
2 before that. Okay? So it's a good test, but it's not
3 super early. It's once it starts moving it's --- it's
4 a problem.

5 Q. Okay. So then what's the predictive value of the
6 creatinine test for diagnosing kidney disease?

7 A. When you get a positive test it's unfortunately
8 not too good.

9 Q. Is it fair to say that blood testing for
10 creatinine levels is among the care that would be
11 provided to someone who sees a doctor regularly?

12 A. We don't normally order that unless there's a
13 reason. Some doctors, as you have pointed out, will do
14 that, but it may not be part of a routine
15 recommendation for a patient who doesn't have any signs
16 or symptoms of anything.

17 Q. Would you find it unusual if several of the
18 Plaintiffs in this matter have had their creatinine
19 levels routinely checked ---

20 A. No.

21 Q. --- as part of the ---?

22 A. It's a good test and doctors check it sometimes,
23 you know, insurance company approval permitted.

24 Q. Were you aware that several of the Plaintiffs in
25 this matter have had their creatinine levels routinely

1 checked as part of the periodic physical exam?

2 A. No. May I add one thing that I neglected to add
3 earlier about creatinine?

4 Q. Sure.

5 A. So it has another use related to the
6 perfluoroalkyl substances besides the diagnosis of
7 disease. This is like albumin but I decided it was
8 important enough to keep it in as well. It's not the
9 only reason. It's one of the reasons. In kidney
10 failure we actually may be clearing less of these
11 things, so it's important to know that as well. So
12 creatinine is a nice marker of kidney failure and the
13 anticipation that your PFAS is going to go down, maybe
14 mitigated if you have kidney failure because it's one
15 of the routes of excretion.

16 Q. Okay.

17 Cholesterol testing whether total LDL, HDL if this
18 test is positive what specific disease, if any, is this
19 test for?

20 A. Well, high cholesterol is ICD now 10 codeable
21 diagnosis and the risk factors are for vascular
22 disease, so that's heart disease, and stroke and other
23 vascular disease which by the way could include kidney
24 disease down the line.

25 Q. Is it fair to say that blood testing for

1 cholesterol levels is among the care that would be
2 provided to someone who sees a doctor regularly?

3 A. It would depend on their age.

4 Q. Cholesterol levels are routinely checked as part
5 of a periodic physical exam in individuals once they
6 start getting into their 20s and --- and older?

7 A. You know, I don't think there's necessarily a
8 recommendation at 20. There may be doctors who do
9 that. We would have to go down and sit down with test
10 for recommendations for when you do that in a
11 asymptomatic individual, but I don't think that it's
12 20.

13 Q. Cholesterol levels are frequently checked in lipid
14 panels along with triglycerides.

15 Correct?

16 A. Yes, that's correct.

17 VIDEOGRAPHER:

18 Counsel, can I go off the record to change
19 the video?

20 ATTORNEY WOLFF:

21 Go ahead.

22 VIDEOGRAPHER:

23 Going off the record at 1:21 p.m.

24 OFF VIDEO

25 ---

1 (WHEREUPON, A PAUSE IN THE RECORD WAS HELD.)

2 ---

3 ON VIDEO

4 VIDEOGRAPHER:

5 Back on the record at 1:22 p.m.

6 BY ATTORNEY WOLFF:

7 Q. Exhibit 13 is an excerpt from the USPSTF Clinical
8 Guide to preventative services from 2014.

9 ---

10 (Whereupon, Exhibit 13, Preventive
11 Services Excerpt, was marked for
12 identification.)

13 ---

14 BY ATTORNEY WOLFF:

15 Q. And if you take a look at page 45 the --- and then
16 it also continues I think with greater depth at pages
17 97 and 99. The USPSTF recommends as a priority testing
18 blood serum level for total cholesterol, LDL and HDL in
19 men age 35 years and older, men ages 20 to 35 years who
20 are increased risk for coronary heart disease and women
21 ages 20 and older who are at increased risk for
22 coronary heart disease.

23 Correct?

24 A. Yes, that's what it says.

25 Q. And would you find it unusual if several of the

1 Plaintiffs in this matter have had their cholesterol
2 levels routinely checked as part of a periodic physical
3 exam?

4 A. No.

5 Q. Were you aware that several Plaintiffs in this
6 matter have, in fact, had their cholesterol levels
7 routinely checked as part of a periodic physical exam?

8 A. No.

9 Q. C reactive protein, did that make the cut in the
10 final merits report?

11 A. No.

12 Q. Why not?

13 A. I didn't think it would help the patients enough.
14 We know it --- we know it's affected. There is
15 evidence of that, but I didn't think it would help them
16 enough to do it. It's one of the things we know, by
17 the way, that's good about PFOA exposure. The
18 direction of the change is lower, which is good.

19 Q. For C reactive protein?

20 A. That's correct.

21 Q. Which is a marker of inflammation.

22 Correct?

23 A. That's right. And that's not surprising when you
24 think of inflammation and immunization. They're
25 essentially --- they're essentially two sides of one

1 coin.

2 Q. Gamma glutamyl transpeptidase, GGTP, if this test
3 is positive what specific disease, if any, is this test
4 for?

5 A. It's good for liver. There are a couple of other
6 things that move around with it, but it's --- it's ---
7 it's about liver and it's helpful in the evaluation of
8 different etiologic causes, underlying etiologic
9 causing of liver disease along with the ALT and AST.
10 And it's a more exotic test that I thought long and
11 hard about and didn't include.

12 Q. What is the sensitivity and specificity of GGT
13 test for diagnosing liver disease?

14 A. None of these tests alone are terribly sensitive
15 at the usual population cut off as we already
16 discussed. They're --- they're much better about being
17 specific.

18 Q. What is the predictive value of the GGT test for
19 diagnosing liver disease?

20 A. That's where they kind of shine. When you ---
21 when you get --- when you have a risk population you
22 start to use these tests. Literature's really good
23 about saying, you know, the test is telling you that
24 there's a liver problem.

25 Q. Is it fair to say that blood testing for GGT

1 levels is among the care that would be provided to
2 someone who sees a doctor regularly?

3 A. No.

4 Q. Would you find it unusual if some of the
5 Plaintiffs in this matter had their GGT levels
6 routinely checked as part of receiving regular care
7 from the physician?

8 A. No.

9 Q. Were you aware that some of the Plaintiffs in this
10 matter have had their GGT levels checked as part of
11 receiving regular care from a physician?

12 A. No.

13 Q. Globulin total. If this test is positive what
14 specific disease, if any, is this test for?

15 A. The test is --- is either for diseases or for
16 immune markers and when I was thinking about it I was
17 thinking about immune markers and subsequently decided
18 that it wasn't enough benefit to the population to
19 keep. To answer your question, total globulins don't
20 diagnose any disease all by themselves. You look at
21 these --- you look at the subpopulations and then you
22 start to see some diseases and that's not actually
23 relevant to the PFOA discussion, which is why --- which
24 is why I didn't include it.

25 Q. So the globulin test dropped out once you got to

1 the merits report.

2 Correct?

3 A. That's correct.

4 Q. Glucose, if this test is positive what specific
5 disease, if any, is this test for?

6 A. We use glucose for diagnosing diabetes. There are
7 a couple of other much rarer conditions that it's used
8 for, by and large this is about diabetes.

9 Q. Is it fair to say that blood testing for glucose
10 level is among the care that would be provided to
11 someone who sees a doctor regularly?

12 A. A fasting glucose?

13 Q. Fasting glucose.

14 A. Yeah. Not necessarily. They might more likely at
15 a certain age get a hemoglobin A1 C, ---

16 Q. Uh-huh (yes).

17 A. --- but I didn't include either in the final
18 because I thought --- this was actually the toughest
19 one that I came across. There's tremendous advantages
20 to doing it, but my --- you know, I sat on the other
21 side of the table and I was a Bennington doctor and I
22 was saying to myself why do that, you know? And so I
23 decided, okay, that's probably what people --- that's
24 probably what my fellow clinicians will say and so I
25 didn't add it. Now, do they really do it in kids where

1 we still have benefit and we want to find things
2 sooner? You know, I don't know that, but I decided to
3 leave it out and it's --- it's a tough call.

4 Q. So glucose and HBA1C tests dropped out by the time
5 you got to your merits report?

6 A. They did. I made every effort to be really
7 conservative and they dropped out, and those are the
8 ones I mentioned to you earlier that I could as easily
9 be criticized for too little as too much. That's the
10 one where I imagine the doctor on the other side of the
11 table saying to me, why the heck didn't you do that?
12 That's the one where I really --- I really look in the
13 mirror and say was that a mistake? It's just a tough
14 call.

15 Q. Running down the list alphabetically.
16 Immunoglobulin serum concentrations of IGA, IGE, IGG and
17 IGM. Did those make the final cut?

18 A. No. They are effective, but they didn't make the
19 final cut.

20 Q. Insulin, did insulin make the final cut?

21 A. No.

22 Q. Then non-alcoholic fatty disease, additional
23 marker. What is that referring to?

24 A. I was thinking about using whichever marker was
25 best, so this would be whatever was the up and coming

1 scout marker. Examples would be cytokeratin fragments.
2 There's some others and I apologize I'm not remembering
3 their names, but there's a bunch of them that different
4 groups are using now to look for this. And what I
5 decided after looking at them was I didn't have enough
6 literature. There wasn't enough familiarity with them,
7 so then I thought it would be in that benefit in the
8 community.

9 Q. So the test for markers of non-alcoholic fatty
10 liver disease dropped out of the merits report?

11 A. Well, ALT and AST are --- and GGT are still in
12 there. They're very conventional markers. The up and
13 coming markers dropped out.

14 Q. So the cleaved cytokeratin fragments test is gone?

15 A. That's correct.

16 Q. What about these T helper cytokines, interferon
17 gamma, interleukin 2 and interleukin 4, did those make
18 the final cut?

19 A. No.

20 Q. TA --- pardon me. TSH, thyroid stimulating
21 hormones, did they make the final cut?

22 A. Yes.

23 Q. If the test for THS is positive what specific
24 disease, if any, is this test for?

25 A. I'm going to say we're at the end, what it means

1 to be positive because it's variable, but the disease
2 --- it's thyroid disease. Not thyroid cancer, thyroid
3 disease. What I want to say about the positive is
4 laboratories report these things as one abnormal or
5 normal and the reality is when you go through the
6 literature they should probably report it as gender,
7 race and age specific normals and abnormals. And that
8 would be more useful to clinicians, but few labs are
9 doing that yet.

10 Q. What is the sensitivity and specificity of the TSH
11 test for diagnosing kidney disease?

12 A. You mean ---? Okay.

13 It's okay. I know what you mean. You mean thyroid
14 disease?

15 Q. Thyroid disease, TSH. Let me withdraw the
16 question then.

17 What is sensitivity and specificity of the TSH
18 test for diagnosing thyroid disease?

19 A. Okay.

20 So it could challenge my memory here. The
21 sensitivity is the thing that you really worry about
22 and there are --- there is a strong clinician minority
23 that says these things are not sensitive enough and we
24 need to be putting patients on medications who have
25 still normal TSH because they're not sufficiently

1 sensitive. They can be --- they can be what we call,
2 you know, centrally normal and the patient can still be
3 ill. That's the argument. I don't buy the argument.
4 I think that these tests are --- they're not perfect.
5 They're pretty good and they're sufficiently sensitive
6 that we should pay attention to them and not try to
7 worry too much about patients who have rare TSHs.

8 If you do decide to worry about it, it requires a
9 reasonably high degree of additional verification to
10 show that there really is a T3 problem that would be
11 agreed to by an endocrinologist and not just somebody
12 saying that in the community. It's a contentious
13 issue, but I think the majority opinion is that it is
14 reasonably sensitive. Now, as to its specificity there
15 is variation over time.

16 Okay.

17 So if you get an abnormal you might want to repeat
18 it. If you get --- if you got your test done at 9:00
19 in the morning and 3:00 in the afternoon there could be
20 like a 30 percent variation. And as you already
21 correctly pointed out, 95 percent intervals are either
22 a bell shape or even an asymmetric curve. You can slip
23 outside. So you have to pay attention. You have to
24 actually know what you're doing and not just look at
25 whether it's normal or abnormal.

1 Q. What is the predictive value of the TSH test for
2 diagnosing thyroid disease?

3 A. I think I already answered that, that controversy
4 that I discussed aside. You get an abnormal TSH when
5 you repeat it, that's patient you should really
6 consider for thyroid disease. Now, there's thyroid
7 diseases that are not responsive to TSH. There are
8 different diseases. They're less common. Now we're
9 talking about something different.

10 Okay?

11 Q. Is it fair to say that blood testing for THS (sic)
12 levels is among the care that would be provided to
13 someone who sees a doctor regularly?

14 A. No. Again, I don't think that's a routine
15 recommendation. If I order a TSH I've got to associate
16 it with the diagnosis.

17 Q. Well, let's see what some of the expert consensus
18 states.

19 Q. Exhibit 14 is the American Thyroid Association
20 guidelines for detection of thyroid dysfunction and
21 please turn with me to the conclusion section on the
22 first page.

23 ---

24 (Whereupon, Exhibit 14, American Thyroid
25 Association Guidelines, was marked for

1 identification.)

2 ---

3 BY ATTORNEY WOLFF:

4 Q. Do you see that, Doctor?

5 A. Yes.

6 Q. And it states that the American Thyroid
7 Association recommends that adults be screened for
8 thyroid dysfunction by measurement of the THS
9 beginning at age 35 years and every five years
10 thereafter. This indication for screening is
11 particularly compelling in women, but it can also be
12 justified in men as a relatively cost effective measure
13 in the context of the periodic health examination.

14 Correct?

15 A. It does say that.

16 Q. Do you agree with that?

17 A. You know, I do. And just for clarification, this
18 is not the USP, the United States Preventive Services,
19 task force who have different recommendations. I
20 actually think these folks are right. I think that
21 this is a better recommendation and I --- I'm not even
22 sure that every five years is good enough when risk
23 goes up, which is the point about medical monitoring.
24 Once risk goes up I think it should be more than every
25 five years.

1 Q. Would you find it unusual if several of the
2 Plaintiffs in this matter have had their THS levels
3 routinely checked as part of the periodic physical
4 exam?

5 A. If they did I would think that their doctors were
6 agreeing with me and so I wouldn't find it unusual at
7 all.

8 Q. Okay.

9 Were you aware that several of the Plaintiffs in
10 this matter have had their THS levels routinely checked
11 as part of the periodic physical exam?

12 A. No, I wasn't aware that they had a TSH level
13 checked.

14 Q. Okay.

15 Triglycerides, if this test was positive what
16 specific disease, if any, is this test for?

17 A. Triglycerides is --- again, it's another lipid.

18 Q. Did the Triglyceride test make the final cut in
19 the merits report?

20 A. No.

21 Q. Uric acid, if this test is positive what specific
22 disease, if any, is this test for?

23 A. Both hyperuricemia and gout are codeable and
24 that's what it's for.

25 Q. And what is the sensitivity and specificity of

1 this test for diagnosing hyperuricemia?

2 A. Sensitivity. You didn't ask about predictive
3 value.

4 Q. That'll be next.

5 A. Okay.

6 So let's think about sensitivity. That's a
7 definitional one, so by definition we have cut offs and
8 so the answer is sensitive because it's defined by
9 itself.

10 Okay?

11 Does that make sense to you?

12 Q. Uh-huh (yes).

13 A. Okay.

14 Now, specificity, if the test is negative does the
15 person have hyperuricemia? No.

16 Okay.

17 So it is specific and sensitive. It still doesn't
18 help you much, so now you get to predictive value which
19 does.

20 Q. What is the predictive value of the uric acid test
21 in diagnosing hyperuricemia?

22 A. Okay.

23 First you have to get it and then when you get it
24 it's still definitional, but it's not definitional for
25 gout.

1 Okay?

2 People can have hyperuricemia without having gout.

3 People can have hyperuricemia with its increased risk
4 for kidney disease without getting kidney disease.

5 Q. What is the sensitivity and specificity of the
6 uric acid test for diagnosing gout?

7 A. I should add one other thing about uric acid ---

8 Q. Okay.

9 A. --- because you asked me something before, which I
10 answered incompletely. Uric acid also goes up with the
11 number of other cardiovascular risks, so it's not
12 absolutely specific for just what we're doing with our
13 uric acid handling and that whole --- whole pathway.

14 Okay?

15 And I should have mentioned that because that's one
16 of the things that we found to be the case with
17 perfluoroalkyl substances.

18 Q. Okay.

19 A. I'm sorry.

20 Q. No, no. That's okay. So what is the sensitivity
21 and specificity of the uric acid test for diagnosing
22 gout?

23 A. How many people with high uric acid get the
24 diagnosis of gout? It's not the majority, but I don't
25 know the percent.

1 Q. What is the predictive value of the uric acid test
2 for diagnosing gout?

3 A. I thought --- I'm sorry. I thought that's what
4 you asked me. That's the question I answered.

5 Q. Oh, okay.

6 A. Because that's the logical question. The other
7 questions are kind of actually --- they're interesting,
8 but not that important to patients. But that one is
9 important.

10 Q. Okay.

11 So ---?

12 All right.

13 So let me --- let me ask the question again. What
14 is the sensitivity and the specificity of the uric acid
15 test for diagnosing gout?

16 A. Okay.

17 So let's see. So if you had a low uric acid and
18 you're not on medications, meaning you don't already
19 have a diagnosis of gout it's --- it's pretty darn
20 specific.

21 Okay.

22 Now, there's other kinds of gout.

23 All right.

24 Not limiting the answer to uric acid gout.

25 Okay.

1 So now let's say that the opposite is true and we
2 got a high one.

3 Okay?

4 So it's a high uric acid. It's a positive test.
5 It's sort of definitional for --- for hyperuricemia,
6 but then the predictive value later down the road. So
7 it's a hundred percent, but the predictive value later
8 down the road, which is the question you asked last, is
9 not a hundred percent. It's much lower. I can't give
10 you the percent, but it's less than half.

11 Q. Is it fair to say that blood testing for uric acid
12 levels is among the care that would be provided to
13 someone who sees a doctor regularly?

14 A. No.

15 Q. Would you find it unusual if several of the
16 Plaintiffs in this matter have had their uric acid
17 levels routinely checked as part of a periodic physical
18 exam?

19 A. No.

20 Q. Were you aware of the fact that some of the
21 Plaintiffs in this matter have had their uric acid
22 levels checked as part of receiving medical care from a
23 physician?

24 A. No.

25 Q. Wouldn't you agree that pregnant women are

1 routinely screened for pregnancy induced hypertension
2 as a standard part of prenatal care?

3 A. Yes, enthusiastically.

4 Q. And post menopausal women do not get pregnancy
5 induced hypertension.

6 Do they?

7 A. We're not talking about anything that's really
8 weird or wild like, you know, implanted --- you know?
9 Generally not.

10 Q. Not in the weird and wild.

11 A. Yeah. Okay.

12 I mean, you do know that there are techniques
13 capable of implanting a --- a --- a --- a developing
14 fetus in people who are no longer menstruating. So
15 that can be done. Whether it's smart or not is a
16 separate question, but in general you are correct. I
17 mean, people --- people are of reproductive age for a
18 specific period in their life. And it's defined by the
19 beginning and --- the beginning is a little tricky, but
20 at the end it gets less tricky, the beginning and end
21 of menstruation.

22 Q. Are women who are in their mid 50s and in their
23 70s going to be breastfeeding infants?

24 A. I've not seen a woman in their 50s breastfeeding
25 infants, but I have read about it and so that's just

1 something for you to know. I've never seen it. I
2 think it's probably pretty rare.

3 Q. Are women in their 70s going to be breastfeeding
4 infants?

5 A. I don't think so.

6 Q. Are you aware of the fact that Linda Crawford is
7 in her 70s?

8 A. No, I don't --- I don't think I know any of the
9 ages of --- or have seen any of those kinds of details
10 from any of the class.

11 Q. So you didn't know that Leslie Addison, for
12 example, is in her middle 50s?

13 A. No.

14 Q. Leslie Addison, all other things being equal, is
15 not a woman of child bearing age.

16 Is she?

17 A. There are some people in their early 50s who give
18 birth. It's pretty rare in their late 50s and it's
19 pretty rare in the early 50s. I think by mid 50 it's
20 next to zero.

21 Q. And Linda Crawford at age 70 is not a woman of
22 child bearing age.

23 Is she?

24 A. No.

25 ATTORNEY WOLFF:

1 Let's go off the record, please?

2 VIDEOGRAPHER:

3 Going off the record at 1:44 p.m.

4 OFF VIDEO

5 ---

6 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

7 ---

8 ON VIDEO

9 VIDEOGRAPHER:

10 Back on the record at 1:50 p.m.

11 BY ATTORNEY WOLFF:

12 Q. Is it correct that if a clinical laboratory or
13 other test is not listed in your merits report that it
14 is no longer included in the medical monitoring program
15 that you are proposing?

16 A. Yes.

17 Q. And is it correct that the only outcomes that you
18 are proposing medical monitoring for are those
19 identified on pages 20 through 25 of your merits
20 report?

21 ATTORNEY WHITLOCK:

22 It's Exhibit 4.

23 A. Yes. That is why I'm proposing at this time. Let
24 me add a small caveat to that. I don't --- I don't see
25 harm in survey questions about other outcomes. I don't

1 see any potential for harm in doing that, but in terms
2 of what we're directing the monitoring enterprise at
3 these are the listed conditions.

4 BY ATTORNEY WOLFF:

5 Q. Sensitivity, when one talks about the sensitivity
6 of a clinical test sensitivity is typically expressed
7 numerically.

8 Is it not?

9 A. Sensitivity, and specificity and predictive value
10 are all numerical concepts.

11 Q. And is there a reason why when I asked you to
12 describe the sensitivity, and specificity or the
13 predictive value of various tests that you are
14 proposing your answers were qualitative rather than
15 quantitative?

16 A. Yes.

17 Q. What was the reason?

18 A. Because it depends on the --- for predictive
19 value, of course, it depends upon population
20 prevalence. For sensitivity and specificity it varies
21 depending on the specific test and for that test it's
22 always a moving target. So your today sensitivity and
23 specificity doesn't have to be your tomorrow
24 sensitivity and specificity.

25 And to the patient --- let's get back to the

1 patient, or the participant or the population. To the
2 --- to the patient or the population the thing that
3 matters is the predictive value.

4 Q. On page 15 of your class certification report you
5 refer to the example of medical monitoring of children
6 and communities for lead poisoning.

7 Correct?

8 A. Yes.

9 Q. And while we know that high levels of lead can be
10 a toxicant, public health screening is not done on the
11 basis of low levels of lead.

12 Is it?

13 A. I find your question to be a non sequitur. Could
14 you rephrase it?

15 Q. Public health screening is not done on the basis
16 of low levels of lead.

17 Is it?

18 ATTORNEY WHITLOCK:

19 I'm going to object --- object to the
20 form.

21 A. The way you've asked that question puts the cart
22 before the horse.

23 Okay?

24 So I can't look at a child unless I know quite a
25 bit of additional information and predict what that

1 child's lead test is going to be. So I don't know in
2 advance. That's why I do the screening.

3 BY ATTORNEY WOLFF:

4 Q. One must have a high enough level and have
5 demonstrated toxicity to justify public health
6 screening.

7 Isn't that correct?

8 A. You're --- you're --- you're asking that question
9 in a way that every physician who does this could
10 disagree with you. I'm sure you're getting at
11 something important, but you've got something confused.
12 We screen children because we don't know their levels.
13 We don't screen children because we do.

14 Q. We know that lead was one of the first metals used
15 by humans and was the cause of the first recorded
16 occupational disease, which was lead colic in a fourth
17 century BC metal worker.

18 Correct?

19 A. I'm not going to debate the --- it's a great
20 literature about which is the first report.

21 Okay?

22 There's --- there's also some --- some people who
23 say there are earlier reports of something different in
24 the Bible.

25 Okay.

1 But whether --- which then you can then start to
2 argue about how far back its antecedents are. With
3 that said, lead is a toxin of great antiquity and
4 you're right that it's very toxic on a pound for pound
5 basis. It's --- it's up there or worse than arsenic,
6 which people don't understand until you explain to them
7 how toxic it really is.

8 Q. And we know that lead was banned from paints used
9 in residential and public buildings in the United
10 States in 1977.

11 Correct?

12 A. I think you're right about '77. I was carrying
13 '79 in my mind, but I think that's more of an asbestos
14 number. I think '77 is probably right for lead.

15 Q. And we know that lead was phased out and then
16 banned from use in gasoline in the United States
17 between the 1980s and the mid 1990s.

18 Correct?

19 A. Right. There's still lead in very specific
20 specialty gasoline or fuels. I think gasoline might
21 not be the right word for some of those specialty
22 fuels, but by and large you just don't buy lead for
23 your car anymore in the U.S.

24 Q. We know that children younger than five are at
25 increased risk for elevated blood level --- blood lead

1 levels and lead toxicity because of increased hand to
2 mouth activity, increased lead absorption from the
3 gastrointestinal tract and greater vulnerability of
4 developing central nervous system.

5 Correct?

6 ATTORNEY WHITLOCK:

7 Object to the form.

8 A. He's correct about everything he said although you
9 put in the context of higher lead levels and central
10 nervous system is not about higher lead levels. It's
11 about an outcome of the lead levels, but everything you
12 said is individually true.

13 BY ATTORNEY WOLFF:

14 Q. And we we know that lead poisoning from
15 deteriorating old paint is the primary source of
16 elevated blood levels in children.

17 True?

18 A. Yes. I tell my --- we tell our residents and
19 medical students and even --- even the freshman taking
20 or sophomore taking introduction to environmental
21 health as undergraduates that 95 percent of the time
22 it's when you find lead poisoning and you look back the
23 answer is paint. And then we go on and tell them the
24 other 5 percent, the really fun things that all the
25 myriad of places, the unbelievable panoply of things

1 that have led to lead poisoning that all of us have
2 seen once or twice.

3 Q. What's the most unusual that you've seen?

4 A. I have a publication which is entitled Home on the
5 Range and that's exactly what it was. This is an
6 ancient publication, early '90s possibly and a family
7 decided that they needed --- that they wanted to have a
8 rifle range in their home. And then they decided that
9 the kitchenette that they built to entertain neighbors
10 near the rifle range was a great place for them to have
11 their food, and that led to a series of consequences.

12 That's the most interesting, but things that people
13 don't know about are also interesting. Somebody who
14 put a hose in a creek and then ran the hose for maybe
15 more than a quarter mile. I mean, I didn't know before
16 that that lead was a common plasticizer. That's how I
17 learned.

18 Okay.

19 And so, you know, you just find these things out as
20 you go. And then everybody knows about the jewelry and
21 cosmetics, but they're rare. You see them, but they're
22 rare.

23 Q. Sure. I mean, we know that the risk factors for
24 increased blood levels in children and adults are
25 largely socioeconomic and they include minority raised

1 ethnicity in urban residents, low income, low
2 educational attainment, older housing, recent or
3 ongoing home renovation, pica, the use of ethnic
4 remedies, cosmetics, exposure to lead glazed pottery,
5 occupational exposure and even recent immigration.

6 Correct?

7 A. Yes. I've not seen one in a recent immigrant
8 myself personally. I've seen all of the above at some
9 time.

10 Q. And we know that treatment options for elevated
11 blood --- blood lead levels include residential lead,
12 hazard control efforts including counseling and
13 education, dust or paint removal, and soil abatement as
14 well as chelation and nutritional interventions.

15 Correct?

16 A. All of those things. Some of them are way more
17 important than others. All of those things are part of
18 the repertoire. And just moving family out, you don't
19 just remediate the home. You try to move --- move the
20 family out.

21 Q. Exhibit 15 is an excerpt from the USPSTF Guide to
22 Clinical Preventive Services 2014.

23 ---

24 (Whereupon, Exhibit 15, Clinical
25 Preventive Services Excerpt, was marked for

1 identification.)

2 ---

3 BY ATTORNEY WOLFF:

4 Q. Please turn with me, Doctor, to page 67.

5 ATTORNEY WHITLOCK:

6 Counsel, I don't believe there is a page
7 67.

8 ATTORNEY WOLFF:

9 Which you're right. My trusty legal
10 assistant is not so trusty.

11 BY ATTORNEY WOLFF:

12 Q. Let me ask you this, Doctor. The USPSTF does not
13 recommend testing asymptomatic children at ages one to
14 five years who are at average risk.

15 Does it?

16 A. You're talking about for lead?

17 Q. Yes, for lead.

18 A. You know, I don't know the answer to that
19 question. We --- it depends on what you mean by
20 average risk. If by average risk you mean we know that
21 this child lives in a neighborhood where all the
22 housing and schools are built after 1977, which there
23 are plenty of places where that is the average, then
24 the recommendation we generally make is that you don't
25 need to screen in that neighborhood unless there's

1 other issues going on. But I don't know that the
2 USPSTF says anywhere that you shouldn't screen children
3 for lead. I --- if it's there, I missed it.

4 Q. Were you aware that the USPSTF found there was
5 insufficient evidence to recommend screening in
6 asymptomatic children ages one to five who are at
7 increased risk?

8 A. Insufficient evidence to screen the USPSTF, to my
9 knowledge USPSTF has never made a recommendation
10 against screening. They may say that the evidence for
11 screening has holes in it, but they have never to my
12 knowledge made a recommendation against screening. And
13 in most of the 50 states, so you're clear, we're doing
14 screening.

15 Q. On page 16 of your report you allude to medical
16 monitoring for asbestos.

17 Correct?

18 A. Yes.

19 Q. The adverse health effects of asbestos exposure
20 have been known for decades.

21 Haven't they?

22 A. Well, we add some more recently, but the most
23 important ones have been known since the '70s and
24 actually people are still fighting about them in the
25 '70s, but yeah they were known. They were just some

1 sort of rear guard people who said, no, it can't be
2 true, but I don't think they exist anymore.

3 Q. And injuries caused or allegedly caused by
4 asbestos have for decades upon decades led to an
5 elephantine mass in asbestos cases in state and federal
6 courts.

7 Haven't they?

8 A. I don't want to pretend that I'm an expert on
9 that. A clinician's perspective is there's a lot of
10 legal activity around asbestos and I'll leave it at
11 that. I don't want to --- in another life could I have
12 gone to law school? Could be, but I didn't.

13 Q. On pages two and seven of your report you make
14 reference to being involved with the C8 project
15 including being responsible for a website that provided
16 open access summary data from that project.

17 Correct?

18 A. Yes.

19 Q. You are aware that by a negotiated agreed upon
20 settlement Dupont has been funding a C8 health project
21 and a medical monitoring program.

22 Correct?

23 A. I know about the settlement. Medical monitoring
24 program, the details of that are not --- the details
25 that were back in 2005 and '06 I'm very aware of. The

1 details going forward I don't have that much in my mind
2 about, you know, what the medical monitoring is for
3 people today.

4 Q. I apologize for blaming my legal assistant. I'm
5 going to give a new exhibit. Exhibit 16 is another
6 excerpt of the 2014 USPSTF Guide and if you would turn
7 to page 67 in this exhibit.

8 ---

9 (Whereupon, Exhibit 16, Blood Levels in
10 Children and Pregnant Women, was marked for
11 identification.)

12 ---

13 BY ATTORNEY WOLFF:

14 Q. And this exhibit does contain page 67.

15 ATTORNEY WHITLOCK:

16 This exhibit does have a page 67.

17 ATTORNEY WOLFF:

18 Sixty-seven (67). Yes, it does.

19 BY ATTORNEY WOLFF:

20 Q. And you see that there's a chart entitled blood
21 levels in children and pregnant women?

22 A. Yes.

23 Q. And if you take a look in the second column it
24 says asymptomatic children ages one to five years who
25 are at average risk?

1 A. Yes.

2 Q. It says recommendation is do not screen for
3 elevated blood levels?

4 A. I see that. I have to figure out what they mean
5 by average risk. They --- I --- I believe they must
6 mean that they know that the child's not where there is
7 lead paint. That's the only thing that I can think of
8 because where there is lead paint we screen kids. We
9 only don't screen kids in neighborhoods where there
10 isn't and that's sort of U.S. wide, so they must mean
11 --- I'd have to delve into the details of this.

12 The preventable consequences of lead poisoning are
13 such that where lead poisoning exists in a community we
14 screen for it. And this recommendation probably has a
15 context in which something like average risk means that
16 there is no known possibility of exposure. So that's
17 all I can think of. Kids around lead paint, we screen
18 and if you live in a brand new suburb in a place where
19 there's never been lead paint and it's a population
20 that doesn't have any outcomes we may not screen.

21 Q. And if you turn to the very bottom of that chart
22 in the same column when the USPSTF balances the
23 benefits and the harms, they say given the significant
24 potential harms of treatment and residential lead has
25 abatement and no evidence of treatment benefit. The

1 harms of screening for elevated blood lead levels in
2 children at average risk outweigh the benefits.

3 Correct?

4 A. I haven't read it, but I assume you read it --- I
5 assume you read it correctly. So I assume they said
6 that.

7 Q. Okay.

8 Exhibit 17 is a paper by Frisbee, you and others
9 entitled The C8 Health Project Design Methods and
10 Participants.

11 ---

12 (Whereupon, Exhibit 17, Dr. Ducatman's
13 Paper, was marked for identification.)

14 ---

15 BY ATTORNEY WOLFF:

16 Q. Correct?

17 A. Yes.

18 Q. And in the C8 health project that you were
19 associated with participants provided a blood sample
20 one time.

21 Correct?

22 A. That's partially correct, but the one that I was
23 associated with at the beginning had only one blood
24 sample. Then later there were follow-up blood samples
25 for the subset of the population under the aegis of the

1 science panel.

2 Q. In this paper Frisbee it's a one time ---

3 A. Yes.

4 Q. --- sampling?

5 A. That's correct.

6 Q. Did you have any role with the C8 medical
7 monitoring program?

8 A. Yes.

9 Q. Exhibit 18 is the April 7, 2017 status report in
10 connection with the C8 medical monitoring program.

11 ---

12 (Whereupon, Exhibit 18, 4/7/17 Status
13 Report, was marked for identification.)

14 ---

15 BY ATTORNEY WOLFF:

16 Q. Have you seen this document before?

17 A. No.

18 Q. Are you aware that since September of 2014 notice
19 packets were mailed to more than 99,000 potential class
20 members in connection with the C8 medical monitoring
21 program?

22 A. I was generally aware that things have gone out to
23 people, but I don't know what's in them or how many
24 people got them.

25 Q. Are you aware that between September 2014 and

1 April 7th, 2017 compared to the 99,065 notice packets
2 that were mailed only 6,681 registrations were
3 received?

4 A. No, I wasn't aware of that.

5 Q. Were you aware that of those 6,681 registrations
6 received 5,957 were deemed eligible for medical
7 monitoring?

8 A. Not aware of that either.

9 Q. Even if all 6,681 registrations received were
10 eligible that's a response rate of less than 7 percent.

11 Correct?

12 A. You said it wrong, but I'm sure you've done your
13 math correctly. You left out a digit there when you
14 were going over it, but I'm sure you calculated it
15 correctly and I'll accept it. The percent you got
16 right. You actually --- when you said the number if
17 you go back and read it ---.

18 Q. 6,681. If that's not what I said, that's what I
19 meant to say. Do you consider seven percent to be a
20 good response rate?

21 A. No, that's not great.

22 Q. Were you aware of the fact that between September
23 2014 and April 7th, 2017 compared to the 99,065 notice
24 packets that were mailed only 2,020 physician
25 appointments were made by eligible class members?

1 A. No.

2 Q. 2,020 physician appointments is just two percent
3 of the potential class members who were mailed notice
4 packets.

5 Right?

6 A. Sounds about right.

7 Q. Do you consider a collective utilization rate of
8 just two percent over the course of more than two and
9 half years to be a good utilization rate?

10 A. No.

11 Q. Since the medical monitoring comes at no monetary
12 cost to the class members do you know why the
13 utilization rate has been just two percent collectively
14 over the course of more than two and a half years?

15 A. I've heard it discussed, but I don't have an
16 opinion other than what I heard discussed. Do you want
17 me to discuss --- do you want me to review what I've
18 heard discussed?

19 Q. No, I only want to know if you know.

20 A. I don't know independent of what I heard
21 discussed.

22 Q. Since screening and asymptomatic population must
23 involve many people to potentially benefit a few does a
24 collective utilization rate of just two percent over
25 more than two and a half years make the C8 medical

1 monitoring program a success or a failure in your
2 opinion?

3 ATTORNEY WHITLOCK:

4 Object to the form.

5 A. You said a couple of things. One is a preamble of
6 that you need to screen many to find a few. That's
7 sometimes true and sometimes not. And then you talked
8 about this effort by actually the Rozen firm because
9 they're actually sort of in charge of it. And I would
10 say that their part of this has been a notable problem
11 and failure. I expected at some point that the people
12 who are in charge are going to find some way to get to
13 somebody who's better than this. When we did the
14 screening you probably do know that it was for those
15 who --- for those who we can account to was in the
16 neighborhood between 80 and 81 percent.

17 BY ATTORNEY WOLFF:

18 Q. Right.

19 That was a survey.

20 Correct?

21 A. You pointed out correctly. It was a one time
22 survey.

23 Q. And they were paid money in order to complete the
24 survey.

25 Correct?

1 A. Right.

2 The settlement --- the settlement went to them as
3 money that came with the survey and then the science
4 panel followed up on a subset, which they chose
5 randomly. And I think that you would have to go back,
6 but my recollection is that they got a better than 60
7 percent response rate. But we'd have to check the
8 literature on that. Those are the articles by --- for
9 example, Steenland, and that would be later in time and
10 I had no part in that.

11 Q. Right.

12 I mean, if we take a look at your paper the
13 Frisbee paper on page 1875 in the middle column, smack
14 dab in the middle of the page it says each verified
15 participate received a \$150 for completing the health
16 survey and an additional \$250 for providing a blood
17 sample regardless of sample quantity or quality?

18 A. Right.

19 That's how --- that's how participants got the
20 benefit when they participated.

21 That's exactly right.

22 Q. On page seven of your class certification report
23 you recommend that the proposed medical monitoring
24 program include a medical survey.

25 Correct?

1 A. Yes.

2 Q. Is it fair to say that this medical survey would
3 fit into the medical surveillance component of your
4 proposed medical monitoring program?

5 A. Yes.

6 Q. And you proposed to base this survey on one used
7 in the C8 health project.

8 Correct?

9 A. It's a model.

10 Q. Exhibit 19 is a document that comes from the
11 website identified in paragraph A on page seven of your
12 report.

13 ---

14 (Whereupon, Plaintiff's Exhibit 19, Website Excerpt,
15 was marked for identification.)

16 ---

17 BY ATTORNEY WOLFF:

18 Q. Have you seen this document before?

19 A. Yes, certainly on the web. Probably even in paper
20 form, too, but for sure on the web.

21 Q. The first page says notice this survey was
22 developed by Brookmar, Inc. for use solely by the C8
23 health project.

24 Correct?

25 A. Yes.

1 Q. And this survey was developed following the
2 settlement of a lawsuit against Dupont.

3 Correct?

4 A. Yes.

5 Q. And the scope of the medical monitoring program in
6 that case was set by the terms of a settlement
7 agreement between the parties.

8 Correct?

9 A. Yes.

10 Q. And this survey collects information on a number
11 of topics ranging from demographics, to employment
12 history, to military history as well as medical, social
13 and family history.

14 Correct?

15 A. Yes.

16 Q. Please turn with me to page three and in the
17 first ---.

18 ATTORNEY WHITLOCK:

19 Counsel is that the third ---

20 ATTORNEY WOLFF:

21 The third page.

22 ATTORNEY WHITLOCK:

23 --- page?

24 Okay.

25 Apparently they are not numbered.

1 ATTORNEY WHITLOCK:

2 Yeah, it does not look like it.

3 BY ATTORNEY WOLFF:

4 Q. Okay.

5 So the third page in this exhibit in the first
6 full paragraph following the heading the purpose of
7 this project. Do you see that at the top, Doctor?

8 A. Yes.

9 Q. Okay.

10 Among other things it says the questions are a lot
11 like those you would find on a doctor's office form.
12 They cover many medical problems, but none of the
13 medical conditions asked about are known to have a
14 connection with C8.

15 Correct?

16 A. Yes.

17 Q. And if you would please turn the page to the next
18 page, page four. Toward the bottom in the paragraph
19 labeled benefits it states that there are a few direct
20 benefits to you for taking part in this project.

21 Correct?

22 A. Yes.

23 Q. And the next paragraph labeled risks states that
24 some people who take this survey may become anxious or
25 concerned about their health.

1 Correct?

2 A. Yes.

3 Q. Is it fair to say that the purpose of this survey
4 was not to screen or diagnose any individuals for a
5 PFOA-related health condition?

6 A. That is fair.

7 Q. Would you agree that its purpose was only to
8 gather medical and social data to conduct a research
9 study?

10 A. It ended up having more purposes than that,
11 however, I would say its intent was to be a population
12 community study. Whether you characterize that as a
13 research study or not, I can debate it, but I don't
14 really care about the debate one way or the other. It
15 was not intended as its primary function to deliver
16 healthcare. It ended up doing that in the few very
17 specific instances which I'm prepared to discuss if you
18 want me to.

19 Q. Let me just ask you this. You would like to use a
20 survey based on the C8 health project survey as part of
21 a medical monitoring program in this litigation.

22 Correct?

23 A. Yes.

24 Q. And how, if at all, would a population based
25 survey such as this one improve the detection and

1 diagnosis in any particular individual of any of the
2 end points that remain as part of your merits opinion?

3 A. Do you want me to go through the end points one at
4 a time again at this point or --- I'm not sure what you
5 want to do next because I feel like we've gone over it.
6 And I don't want to --- I don't want to belabor
7 anything, but I'm willing to go back over each --- each
8 thing that we do and discuss it and that's up to you.

9 Q. I guess I'm just trying to grapple with the notion
10 of how a survey such as this one improves the detection
11 and diagnosis of disease in any particular individual?

12 A. So at this time I think you're asking me about
13 history. I mean, I'm going to think I understand your
14 question and talk about the passage of time, what we
15 knew then and what we know now and see if I --- see if
16 you think that gets at your question.

17 Then what we knew about PFOA --- and by the way
18 PFOS and PFHxS and PFNA was not a lot, especially not
19 in humans. There was essentially no information and
20 there was a claim that it was physiologically inert in
21 humans actually this time, which the survey shows.
22 And other things that were happening simultaneously
23 showed to be not correct.

24 Okay.

25 So the things that were found in this survey and in

1 other information, not just this survey, then provided
2 us with an idea of what are the human outcomes. This
3 --- this was early than others replicated or didn't
4 replicate depends on what outcome you're talking about.
5 For the replicated outcomes some of the things that are
6 in this survey are still the things that you would want
7 to ask. The design is kind of nice. It worked very
8 well on the web.

9 Virtually everybody who filled it out actually was
10 able to do it on the web and come in for help or
11 validation, which was very efficient, and so I kind of
12 like that design. I think it was a good thing to
13 replicate in terms of sort of community friendliness.
14 Now, this covers topics that are no longer proposed
15 there. They're now edited out because back then we
16 didn't know.

17 There's also mixed topics that, you know, I go you
18 got uric acid and you didn't ask about gout, you know.
19 So gout information is now coming out later.

20 Okay.

21 But you can't tell anything about gout from this
22 survey because we didn't ask.

23 All right.

24 So that's --- that's about the passage of time. We
25 know things from this survey. We know what to pull out

1 of it and what to ignore. In addition really important
2 concern of this survey is now much less of a concern
3 based on lots and lots of additional information that
4 this survey got and others. And that is that if you
5 have this in your water, water becomes the source of
6 exposure. That was not known at the time.

7 Okay?

8 We did not know that. It was a hypothesis that it
9 would be. It was a hypothesis that was vigorously
10 disputed by some people. We now know it's the case, so
11 we don't have to do some of the extensive questions
12 that we asked here about which job, and then which job,
13 and then which job. And we could cut back on some of
14 the other things, too. So we can streamline the survey
15 and add some things to it, it will still be smaller.
16 Is that where you were going with your question or do
17 you want me address individual diagnoses again?

18 Q. I --- no, no. That was the spirit in which I
19 asked ---

20 A. Okay.

21 Q. --- the question.

22 A. I apologize. I also forgot. We had an idea that
23 pregnancy was going to be important, but we also didn't
24 how it was going to be important. We didn't know all
25 of the ways it was going to be important, so it may be

1 that we can streamline some of those pregnancy
2 questions. This --- this has a lot of reiterated
3 information. It's actually bigger than this printed
4 document suggests about how much pregnancy information
5 you could put into the survey.

6 Q. On page --- the top of page five of your merits
7 report, which is Exhibit 4, you make reference to the
8 C8 science panel having found a, quote, probable link,
9 closed quote between PFOA exposure, and kidney cancer
10 and PFOA and testicular cancer.

11 Correct?

12 A. Yes.

13 Q. Are you relying on the probable link findings from
14 the C8 science panel in forming your opinions in this
15 case?

16 A. I'm relying on the epidemiology, yes, that's been
17 published. That's part of --- the probable link piece
18 of it is a kind of a term of art that was used in the
19 --- in the settlement and so I'm quoting the settlement
20 words because that's the technical correct thing that
21 happened in the community. The publications themselves
22 didn't get to the words probable link. The
23 publications were just what you would expect to see for
24 epidemiology.

25 Q. Right. So the C8 science panel made a number of

1 probable link determinations for lack of a better
2 phrase, I mean, they took a look at maybe three dozen
3 or so end points and they said we don't think there is
4 a probable link for the vast majority of them and we
5 think there is a probable link for a handful of them.
6 And my question to you is are you relying on any of
7 those so-called probable link findings for that handful
8 of end points in forming the basis of your opinions in
9 this case?

10 A. I think I've answered the question, but I'm happy
11 to repeat it in case repetition can bring clarity.
12 It's the studies, not the --- not the term of art.

13 Okay.

14 The term of art is something I merely quoted
15 because it's on us to understand that's what they were
16 asked to do for their formal role, but it's the
17 epidemiologic studies themselves and they're not the
18 only things. They're the things that inform my
19 opinion.

20 Q. So here's --- here's the disconnect and maybe we
21 can just clarify it. Members of the C8 science panel,
22 Carl (sic) Steenland and others have submitted
23 manuscripts to peer review medical and scientific
24 journals. And some of those manuscripts have now been
25 published in the medical and scientific literature, and

1 I know that you've cited a number of those in your
2 report.

3 Correct?

4 A. Yes.

5 Q. As distinguished from the papers that have been
6 published in the peer reviewed literature the probable
7 link findings are available only on a website. They've
8 not been submitted for peer review, they've not been
9 published in a journal.

10 Correct?

11 A. Well, I don't know the answer to that and let me
12 tell you why. There is this one review article they
13 did in which they discussed some of that stuff and I
14 don't know if that's in the review or not. So I just
15 can't answer.

16 Q. My --- I guess my question is, are you relying on
17 these probable link reports that are found primarily if
18 --- or if not exclusively on the website in forming
19 your opinions?

20 ATTORNEY WHITLOCK:

21 Objection. Asked and answered multiple
22 times.

23 A. Objection aside I'm happy to repeat what I said
24 before. Would that be helpful?

25 BY ATTORNEY WOLFF:

1 Q. Yeah, go ahead.

2 A. Okay.

3 They published the epidemiology.

4 Q. They published. I get it that they published.

5 A. And --- and those epidemiologic --- epidemiology
6 studies --- and it's Kyle Steenland. You said Carl.

7 Q. Oh, I thought I said Kyle.

8 Okay.

9 A. Anyway --- and by the way, Kyle is actually
10 Nelson, which makes it even more complicated, but he
11 goes by Kyle. And it's Kyle in the National Library of
12 Medicine. So he's Kyle, but those epidemiology studies
13 are what I rely on and I --- I didn't mean to cause any
14 confusion.

15 I just wanted to be transparent that their role was
16 --- you know, their formal legal role as requested by
17 the settlement, which both sides agreed to, was, you
18 know, to find these probable links or to rule them out.
19 And that's what they did as you pointed out on the
20 website and that's not what I --- I don't think I
21 referred to those, and if I did I probably shouldn't
22 have. But I don't think I did.

23 Q. Okay.

24 Because I saw --- I saw the probable link
25 referenced at the top of page five of your report, your

1 merits report, which is why I'm asking these questions.

2 A. Yeah.

3 Okay.

4 It's --- it's the studies.

5 Q. The --- the published studies?

6 A. The published studies.

7 Right.

8 Q. So if I go to the archived peer reviewed published
9 literature that's what you're relying on?

10 A. Correct.

11 Q. Not the stuff that's on the website?

12 A. It's --- it's nice to have that stuff. It tells
13 you very succinctly what their opinion is and their
14 opinion is based upon their published studies.

15 Q. Okay.

16 A. There's one small topic not related to what we're
17 doing where actually you have to go to the website and
18 see what they thought and it's none of these things.

19 Do you want me to go over that?

20 Q. No.

21 A. Okay.

22 Well, you raised the point about what's on the
23 website --- what's on the website and what's --- what's
24 in the literature. There is one topic that's only on
25 their website where I know they're correct because

1 we've seen it and we're going to characterize it in a
2 peer review because it's never been done. But it's
3 actually not related to anything that we've been
4 discussing here. It's indirectly related to one topic,
5 but it won't be related to the proposed medical
6 monitoring.

7 Q. Let me take a break because I'm either done, or
8 just about done or want to confer with my colleague?

9 VIDEOGRAPHER:

10 Going off the record 2:32 p.m.

11 OFF VIDEO

12 ---

13 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

14 ---

15 ON VIDEO

16 VIDEOGRAPHER:

17 Back on the record at 2:39 p.m. Dr.

18 Ducatman, thank you. I have no further questions for
19 you at this time.

20 A. Thank you.

21 ATTORNEY WHITLOCK:

22 No questions.

23 * * * * *

24 VIDEOTAPED DEPOSITION CONCLUDED AT 2:39 P.M.

25 * * * * *

1 **ACKNOWLEDGMENT OF DEPONENT**

2 I, ALAN DUCATMAN, M.D., do hereby certify
 3 that I have read the foregoing transcript of my
 4 testimony taken on 2/28/18, and further certify
 5 that it is a true and accurate record of my
 6 testimony (with the exception of the corrections
 7 listed below):

8	Page	Line	Correction
9	_____	_____	_____
10	_____	_____	_____
11	_____	_____	_____
12	_____	_____	_____
13	_____	_____	_____
14	_____	_____	_____
15	_____	_____	_____
16	_____	_____	_____
17	_____	_____	_____
18	_____	_____	_____
19	_____	_____	_____
20	_____	_____	_____

21 _____
 ALAN DUCATMAN, M.D.

22 SUBSCRIBED AND SWORN TO BEFORE ME

23 THIS _____ DAY OF _____, 20____.

24 _____
 25 (NOTARY PUBLIC)

 MY COMMISSION EXPIRES:

1 COMMONWEALTH OF PENNSYLVANIA)

2 COUNTY OF ALLEGHENY)

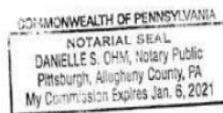
3 CERTIFICATE

4 I, Danielle Ohm, a Notary Public in and for the
5 Commonwealth of Pennsylvania, do hereby certify:

6 That the witness whose testimony appears in the
7 foregoing deposition, was duly sworn by me on said date
8 and that the transcribed deposition of said witness is
9 a true record of the testimony given by said witness;

10 That the proceeding is herein recorded fully and
11 accurately;

12 That I am neither attorney nor counsel for, nor
13 related to any of the parties to the action in which
14 these depositions were taken, and further that I am not
15 a relative of any attorney or counsel employed by the
16 parties hereto, or financially interested in this
17 action.



22 Court Reporter

23 Danielle Ohm
24
25

[& - 2:39]

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[3 - accurate]

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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